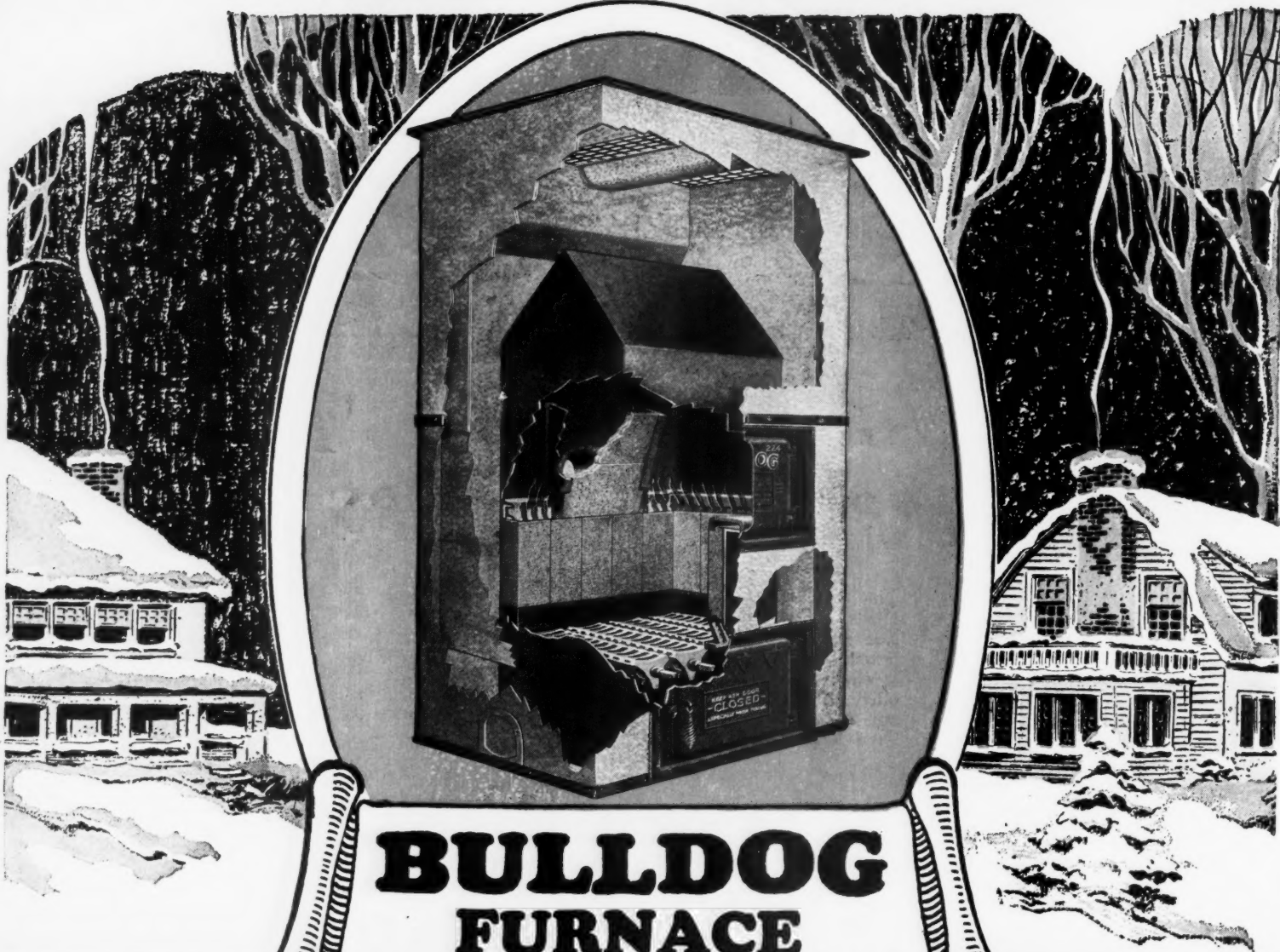


HORTICULTURE DEPARTMENT
Delaware Agricultural Experiment Station

AMERICAN FRUIT GROWER MAGAZINE



July, 1928
Ten Cents a Copy



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REMOVING the SPRAY RESIDUE From APPLES and PEARS By J. S. Jones Oregon Agricultural College

THE FRUIT INDUSTRY for years has accepted as inevitable the necessity for more or less frequent applications of insecticides and fungicides to growing fruit. It would almost seem that the very nature of the material used for the control of insect pests and fungous growths should have caused the industry long ago to accept also as inevitable the necessity for the removal from harvested crops of excessive amounts of spray residues. Be that as it may, the decision on the part of the Bureau of Chemistry officials in 1926 that a clean-up on fruits intended for interstate and foreign shipments was immediately in order, caught growers and shippers the country over totally unprepared to solve the difficulties involved in a clean-up program. This article will relate how such difficulties, more or less common to all western pear and apple growing districts, have been met and in a large measure solved in one large fruit growing section of southern Oregon—the Rogue River Valley—which ships each year from 2500 to 3000 cars for interstate and foreign trade.

"Excessive amounts" implies danger to the consuming public. Decision as to what constitutes excessive amounts of substances foreign to natural products of the soil rests with enforcement officials of federal pure food laws. The first announcement of the standard on fruit in the matter of spray residues indicates that attention up to 1926 had centered on the arsenic fraction. The clean-up order of 1926 made it perfectly clear to growers and packers that shipments moved in interstate and foreign trade, and found to carry 1/100 grain or more of arsenic, expressed as As_2O_3 , per pound of fruit, were subject to seizure and condemnation. So drastic seemed the clean-up order to growers and shippers that complete ruination of their industry was freely talked.

Disaster indeed was imminent, and was diverted only by energetic work on the part of a small group of leaders, both within and without the industry, who forcibly pointed out the necessity of some standard in the matter of spray residues and the advantage to be gained by the industry in determined efforts to meet at once the high one set as nearly as was

The "Clean-up" Order of 1926 Appeared to Threaten Disaster to the Apple Industry, Allowing, as it did, but 0.01 Grain of Arsenic Residue to a Pound of Fruit. Brushing and Wiping Proved Ineffective in the Removal of Arsenic, Though Added to the Appearance and Salability of the Fruit. Acid Solvents Proved Practical, without Affecting the Keeping Qualities. A Summary of Two Years' Experience in Residue Removal in Rogue River Valley.



A type of fruit cleaning equipment designed for heavy volume work in a western packing house. Dirt, leaves and litter are removed before the fruit receives the acid bath. In this particular machine, the dilute acid is sprayed on the fruit, after which the rinsing and drying operations complete the process of spray residue removal.

humanly possible. Now with two seasons' experience in spray residue removal to look back upon, it is clearly seen that the determination to face the situation squarely was a very helpful factor in solving it.

It must not be inferred that previous to the clean-up order of 1926 no effort whatever had been made by packers and shippers to remove spray residues. The grading machines in common use were equipped with devices for brushing the fruit as it was moved forward in the process of grading, and unquestionably the fruit was somewhat improved in appearance by the treatment it was given.

Previous to the summer of 1926, however, apparently no one knew to what extent spray residues were retained by the fruit at harvest time, or to what extent they were removed by the brushing machine. The clean-up order quickly brought forward this much needed information. Chemical determinations created surprise over the largeness of amounts retained, and almost incredulity over the smallness of amounts removed by machine wiping.

Convinced by the test runs previous to the opening of the packing season of the ineffectiveness of mechanically operated brushes in spray residue removal, the management of most packing

plants at the outset of the 1926 packing season employed crews of women and girls to supplement mechanical with hand wiping, using soft cloths or gloves. That effort, too, proved to be of little value; so likewise were efforts to make wiping more effective by the use of a little oil or glycerin sprinkled over both rolls and gloves. The sum total of machine and hand wiping was more or less mechanical injury to the fruit, and when oil was used, unspeakable harm was done to the ripening properties of pears under cold storage conditions. At the same time, a large number of chemical analyses accumulated, which proved beyond doubt the impracticability of spray residue removal by any method or combination of methods of wiping proposed.

Fortunately for the industry, some experimental work in the chemical and horticultural laboratories of the Oregon Experiment Station was suf-

ficiently advanced by the opening of the 1926 packing season to enable reasonably safe prediction of results. From a long list of possible solvents of spray residues, commercial hydrochloric acid in very low concentrations gave promise of very effective service, with no injury to the treated fruit that could be detected in rather short periods of observation following treatment.

Convinced of the futility of attempts to clean by mechanical devices or hand wiping, and with a feeling akin to desperation, packers fell in with the suggestion of experiment station chemists to give the acid treatment a trial. They did so in crude tanks of matched lumber, for holding the cleansing acid, neutralizing solution, and rinsing water, in which the fruit was suspended in cord nets. Following a few hours of drying in lug boxes, the fruit was graded and packed in the customary manner. The results were convincing to even the most skeptical. Rigid inspection and

systematic chemical tests in an improvised district laboratory quickly established the efficiency of this method of spray residue removal. With 75 per cent or more of the tests on this washed fruit indicating an arsenic content far below the tolerance set for foreign shipments, something in the way of confidence among growers and packers began to appear.

When a little later cold storage experiments with acid-dipped fruit, running concurrently with these first attempts at cleaning with solvents, indicated perfect keeping properties, the gloom of the first days of the packing season practically disappeared. Acid treatment of pears and apples, the principal fruits of the valley, for spray residue removal appeared to be both safe and feasible. Notwithstanding the difficulties of handling a large crop in this crude fashion, glutted packing houses were quickly cleaned up and the balance of the crop harvested and moved out to markets in condition

to meet the most rigid inspection on the part of federal officials. Threatened disaster to the 1926 crop had been averted by a narrow margin.

Experiences of 1926 had given the fruit industry, in this particular valley at any rate, a dependable cleansing agent for spray residues. The season of 1927 brought from manufacturers of orchard and packing house machinery various patented devices for using it effectively. Three types of machines have been given as thorough trial now as is possible in one season.

One type of machine is designed to accomplish the work through drenching of the fruit by means of finely divided and forcefully driven spray liquids thrown by pumps through semi-circular openings in hard rubber pipes, which are placed above and below the rod conveyor, on which the fruit is carried through the middle of the spray chamber. Contact of fruit with the acid spray approximates 30 to 40 seconds. From the acid (To Page 20)

TEN THOUSAND BARRELS of APPLES

From a 100-Acre Orchard.

By M. B. Cummings
University of Vermont.

THE RISE of commercial orcharding in Vermont, in view of the small size of the state, is a remarkable development of the last 15 years. There are in Vermont six orchards of over 100 acres each, three of over 200 acres, and one over 500 acres. All are doing well. But how well?

How are these orchards of such extensive areas getting along? It is, of course, a little early to tell, for most of them are now just coming into full bearing, but they are all showing up well. The crops for 1927 were the best of all those produced.

As an illustration of the general status of the orchards, let us take one of these 100-acre orchards on which figures have been kept, to show what is being done in apple production where the area is extensive.

Loomis Orchard Typical

Since many of the large areas devoted to fruit are on the west side of the state, a Champlain Valley orchard will be selected, namely that of E. N. Loomis, whose orchard is at Vergennes and who has wholesale warehouses in New York City. This immense orchard is fairly typical of many other large ones in Vermont, and will represent fairly well a phase of commercial orcharding in the Green Mountain state, which was fortunate last year in having the largest percentage of a crop of any of the New England states. Attention will be drawn in this story to the varieties planted, the care of the orchard, comparative yields, relative prices of nine varieties of apples, and the cost of marketing the apples.

The Loomis orchard of 7000 trees was set out in 1911 and is comprised mostly of McIntosh, Northern Spy, Rhode Island and Northwestern Greenings, Tolman, Winter Banana, Wealthy, Alexander and King. In 1927, of the 10,000 barrels of apples produced, the McIntosh made up fully half the total.

In brief, the care of the orchard has been as fol-

A Large-Scale, Commercial Apple Orchard in New England, Comprising Seven Thousand Trees. One of Several Similar Vermont Apple Plantations. A Demonstration of Volume Production.



This beautifully landscaped modern home of the owner, E. N. Loomis, is located in the midst of the 100-acre orchard. (Above) A group of University of Vermont students on a visit to the Loomis orchard to study the methods that have contributed to its success.

lows: The land has been cultivated much of the time to date, although the sod mulch has been used with satisfaction. Last year the orchard was partly in sod and partly in cultivation. The spraying has been thorough and orthodox. Some of the trees received seven applications, others only five. Liquid sprays only were used. Apple scab has been the only serious pest, but, save for one year, it has been held in check. Aside from some manure and cover crops, the trees have received five pounds of nitrate per tree each year. One-fourth of the orchard is manured each year, cultivated one season, then stocked down with alfalfa, which gives a "three-year-laydown."

Comparative Yields of Nine Sorts

The orchard has produced seven sizable crops, of which the 1927 crop was the largest—10,000 barrels in a year when a crop of good quality constituted "a killing in orcharding." As the figures in Table 1 show, the 1921 crop consisted of 748 barrels; the 1922, of 2524; the 1923, of 939; the 1924, of 3643; the 1925, of 6663; the 1926, of 4905; and the 1927, of 10,000 barrels.

The number of barrels of apples of grade one and grade two is also shown in Table 1. These figures reveal how the nine varieties graded out in six years. It will be seen that Kings failed to bear only two years after the first crop; the Spies skipped only two times; the Tolmans produced no fruit in three years while all the other sorts bore more or less after the first crop in 1921.

A few statements on some items in marketing will be of interest. The cost of marketing a barrel of apples is approximately \$3. This amount includes the cost of picking, which is approximately 29 cents a barrel for labor and supervision; the cost of barrels with

trappings; the cartage charge from orchard to train, a distance of eight miles; the transportation charge to New York; and the cartage charge of seven cents in New York City. (To Page 17)



A general view of the sweet cherry block at Thrushwood Orchards, Beulah, Mich. This view is looking west toward the Lake Michigan bluffs.

HARVESTING and MARKETING The SWEET CHERRY CROP

IN THE ARTICLE on the culture of sweet cherries in the March issue, I tried to stress the importance of producing large and perfect fruit. The picker cannot make perfect fruit, but by using a little judgment, he can select the largest and ripest fruit. At the beginning of the season, this is more necessary than later, because it is desirable to lengthen the marketing season as much as possible. The harvesting must have expert supervision by field men who not only know their business from a technical end, but also know how to get along with the pickers. The fact that we have never had even a semblance of a strike, and have never had any trouble in getting pickers, is largely due to the tact and ability of these men. Where do I get them?

Starting as vacation pickers years ago, they just naturally worked into the job. One of the men is now a Lutheran minister in Brooklyn, N. Y.; another is a principal in the Detroit school system; but they look forward to the cherry harvest as the bright spot of the year. It makes possible a vacation which they and many other pickers can afford and enjoy.

The fruit is weighed, not measured, in the orchard as picked, and settlement with the picker is made on that basis. Along with this weight, the field man notes the particular block and variety of fruit, so that at the end of the season we have an accurate record of yields and varieties, as well as blocks which may have undergone different treatment.

The pickers put the cherries in lugs holding about 25 pounds, and after each lug is weighed, the picker's number is put into it. When the lugs reach the sorting table, by knowing the pickers' numbers, we have a further check on their work.

To facilitate the sorting, we have developed an efficient moving belt about two feet wide and 12 feet long. The space between the top and bottom, caused by

The Packing of First Quality Sweet Cherries in Small, Attractive Packages for Parcel Post and Express Shipments Has Enabled This Grower to Build a Profitable, Direct-to-Consumer Trade.

By A. J. Rogers

Proprietor Thrushwood Orchards, Michigan.

the diameter of the rollers, is filled with five removable trays. The fruit is spread on the belt from a flat canvas hopper. The main grade of sorted cherries falls gently from this belt onto a soft can-

quart crates. Most of the cherries are of uniformly good size, and instead of crates, a standard western 15-pound box is used for packing. By means of this arrangement, sorters can go over four tons of an average run of cherries in 10 hours, at a cost of about one-half cent a pound.

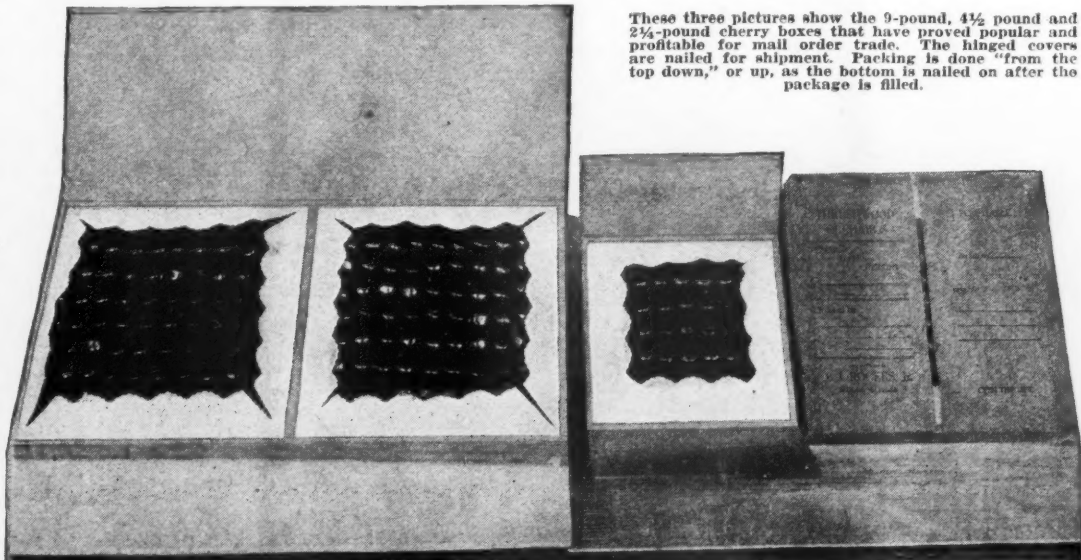
From the sorting machine, the cherries in the packing-shed boxes are taken on a conveyor to a rack on the packing tables, or if these racks are full, the boxes are put in racks made along the wall. The packer now has one of three grades of cherries which he is instructed to check over to see that the sorting out

of the culls is perfect. The fanciest grade comes from the trays and is used largely for mail order business in two and one-quarter, four and one-half, and nine-pound boxes. The second grade, which constitutes about 90 per cent of the sorted cherries, is packed in a 15-pound lug. The third grade goes into a 16-quart ventilated crate. A good grade of culls or slightly cracked cherries is also sometimes taken from the cull trays and dumped into common 16-quart crates. These cherries are largely for local consumption

or for truckers who want a cheap cherry.

The boxes and the 15-pound lug are made of cigar box wood. The face of each is outlined with lace paper and covered with oiled paper, to keep the cherries perfectly clean. Not only does the lace paper justify itself in looks, but it serves to cover up a half row which is sometimes necessary in finishing a "face."

Very great care and experience are necessary to pack the fanciest grade, and our oldest and best packers are put on this work. The box comes to the packer with the top on and the bottom open.



These three pictures show the 9-pound, 4 1/2 pound and 2 1/4-pound cherry boxes that have proved popular and profitable for mail order trade. The hinged covers are nailed for shipment. Packing is done "from the top down," or up, as the bottom is nailed on after the package is filled.

The cherries are placed in rows in the boxes with the stems up, but with the flat side and the largest side of the cherry next to the bottom, which when packed and opened becomes the face of the top.

By properly selecting the cherries, the rows on this face are made straight in both directions. In this fanciest grade, the cherries must be one inch in diameter, which means just nine rows across the face in the nine-pound box. The second layer of the packing consists of filling in the spaces left by the first layer so that the completed face will show no stems. The balance of the pack is filled in "hit or miss." If packed like the first two layers, it would make either a slack pack or a pack too full. Great care must be used to fill the corners and sides firmly, and on this the packers are checked by the nailers, who make the final inspection. The tops of the boxes are opened occasionally to make sure the facing is being done carefully.

The method described has gradually been forced

upon us in the packing of the lugs as well. While the packed lug is not as fine to look upon as the smaller boxes, it presents a very attractive face and is exceptionally well received on the market.

Taking more pains in sorting and packing, and putting more expense in the package have naturally increased the cost per pound of the fruit. The following table shows this increase during the last three years. These figures include all overhead items, such as supervision, bookkeeping, the packing shed and equipment, etc.:

HARVESTING COST PER POUND OF FRUIT

	1925	1926	1927
Cents	Cents	Cents	Cents
Picking	2.0	2.0	2.0
Packing (including sorting)....	1.7	1.9	2.3
Package	1.0	1.2	1.9
Total	4.7	5.1	6.2

This does not seem like good management, but when it is realized that this better packing has been a factor in increasing the net price per pound, the figures do not seem so high. The following table brings out this point:

GROSS PRICE PER POUND OF FRUIT

	1925	1926	1927
Cents	Cents	Cents	Cents
Gross price, f.o.b. farm.....	9.5	11.8	19.6
Total harvesting cost.....	4.7	5.1	6.2
Net value on tree.....	4.8	6.7	13.4

The gross price was figured from the picking weight record, so includes a shrinkage due to culls, overweight in packages, etc.

We have had our fruit transported to market by express, by refrigerator car, by boat, by truck and by mail. Our express service was never satisfactory, both as to delivery and care en route. For several years the growers (To Page 18)

BIRDS in the ORCHARD

Insectivorous Birds Are the Natural Control of Insect Life. Where They Are Encouraged and Permitted to Live and Reproduce, the Cost of Artificial Control with Chemicals Is Sharply Reduced. A Study of Four of Our Feathered Friends and Helpers.

By John B. Behrends



Chickadees are natural scale exterminators, and will subside all winter on scale insects and on overwintering insects and eggs, which they industriously pick out from the bark scales.

BIRDS are of great value to the fruit grower at all times of the year, but few orchardists appreciate the true importance of these little winged creatures of the air. They are active everywhere; flickers, blackbirds, robins, and thrashers seek their insect prey on or near the ground; woodpeckers, nuthatches, titmice, and chickadees closely search the trunks and limbs of trees; vireos and warblers scan the leaves and probe the flowers; and flycatchers and swallows sweep their prey from the air. Every few minutes all day long the hungry young must be fed, and enormous quantities of food are carried to them, as can be attested by their rapid growth. Orchards, gardens, and berry patches benefit by the good work of the birds. Birds fly long distances to visit the orchard at times when certain insect pests tend to destroy some of the most valuable trees.

The birds of greatest value to the fruit grower are the woodpeckers, nuthatches, titmice, and chickadees. These little fellows closely search trunks and limbs of trees, and are with us throughout the year.

Among the destructive insects that the woodpeckers eat are all species of scale insects. Wood-boring beetles and larvae are also sought by woodpeckers and eaten in great quantities. Next in importance are the ants that live in decaying wood. Many ants are particularly harmful to the trunks and larger limbs of fruit trees, for if they find a small spot of decay in the vacant burrow of a wood borer, they enlarge the hole, and, as their colony multiplies rapidly, continue to eat away the wood until the whole trunk or limb is honeycombed. Other birds are unable to secure these pests, but woodpeckers have beaks and tongues especially adapted for digging them out and devouring them.

The downy and hairy woodpeckers may be heard

pecking in the orchards on any day in the year, while the golden-winged fellows and redheads spend many hours each day there throughout the spring and summer.

The golden-winged woodpecker secures most of his food from the ground in the form of ants. He awkwardly hops over the grass until in the midst of an ant colony and then pokes his long bill into an ant hole. Then he thrusts out his long tongue, which is barbed and coated with sticky saliva. The creeping ants adhere to it and are drawn into the woodpecker's mouth by the hundreds. The stomach of one golden-winged wood-



All species of woodpeckers make a specialty of bark-boring insects, which they have the faculty of locating through the bark.



The acrobatic nuthatch appears to prefer to walk down a tree head-foremost. He varies his diet of insects and eggs with weed seeds.

pecker upon examination contained 5000 ants.

The redheaded woodpecker visits fruit trees and secures a variety of insects from the bark, as do the hairy and downy woodpeckers, but he makes a specialty of capturing flying insects in the air. From a perch on a post or telephone pole he darts out in true flycatcher style to snap up beetles and wasps in flight. He also devours grasshoppers, and consumes a negligible quantity of fruit.



The titmouse eats insects and little of anything else. Examination of the stomachs of one brood showed but three-fourths of one per cent of vegetable matter. It feeds on insects, caterpillars, pupae and eggs. Its favorite article of diet is the codling moth and larva.

The cheerful chickadee or black-capped titmouse that brightens many a dull day in the winter time, will eat from 200 to 500 insects in one day, or as many as 4000 insect eggs. Chickadees are small in size, but are far from being so in the matter of food consumption. What they lack in size of body, they more than make up in numbers. Ever on the move, their keen little black eyes enable them to see and to pick off countless insects overlooked by larger birds. In the bitter cold of winter when other birds have flown to warmer climes, the chickadee industriously works through the orchard, and it is at this season that he does the greatest good. No flying or crawling insects are to be found, so the chickadee must feed upon such species as he finds hibernating in crevices, or upon the eggs of insects laid in similar places. Only when the tree trunks and branches are covered with sleet is sufficient food for these birds of the titmouse family hard to secure.

Examination of 289 stomachs of the black-capped chickadee showed that its food consists of 68 per cent animal matter, chiefly insects, and 32 per cent vegetable matter. The former is made up of small caterpillars and moths and their eggs. Prominent among the eggs are the eggs of the tent caterpillar moths which infest the orchards and lawn trees. These are two of our most harmful insects, and the chickadee deserves our highest appreciation for disposing of them for us. During the winter, the chickadee's food is made up of larvae, chrysalids, and eggs of moths, varied by a few seeds, but as spring brings out hordes of flying, crawling, and jumping insects, the bird varies his diet by feasting on some of these also. Flies and bugs are the favorites until the weather becomes quite warm, when beetles and small wasps are added to the bill of fare. (To Page 21)

NEW METHODS PROMISE SUCCESS In CODLING MOTH Control

Two of the More Important Auxiliary Control Measures, Directed Against Summer Broods of the Codling Moth, Are the "Hootch Trap" and the Chemically Treated Tree Band. Both Give Assistance to the Summer Spray Program.

By A. R. Chase

County Agent, Wenatchee, Wash.

TIGHTENING of restrictions on spray residue has forced the horticulturists and entomologists of the apple growing sections to look for other means of controlling the codling moth. Attention has been turned to methods which will insure the highest maximum efficiency of spraying with the least possible number of sprays. Entomologists of state and federal experiment stations are concentrating their efforts toward this end, and the possibility exists that the use of lead arsenate may become a minor factor in the control of this pest in the near future.

Recent investigations have turned largely to applying the ounce of prevention rather than the pound of cure. Reasons are very obvious. If the insect is to be killed in the larval stage by spraying, the injury to fruit will probably always be considerable, but if it is killed in the egg stage or in the moth stage, the damage to the fruit by the insect is prevented.

In a codling moth clean-up campaign, the first essential seems to be orchard sanitation. Destruction of the overwintering moths in warehouses and packing sheds is another step in the right direction. Hauling the apples after harvest to a central packing shed rather than packing them on the farm, and the fumigation of those packing sheds and boxes, offers a chance to cut down on the hold-over moths.

Applying the same ounce of prevention rather than the pound of cure, it becomes obvious that orchards which are well spaced and well pruned offer a better chance for a clean-up. A general survey of 300 orchards in this district by the writer indicates that the man having a well spaced orchard has a 25 per cent better chance to control the codling moth by spraying. But the future points to the necessity of using those practices which will destroy the adult moth and the egg rather than the larva.

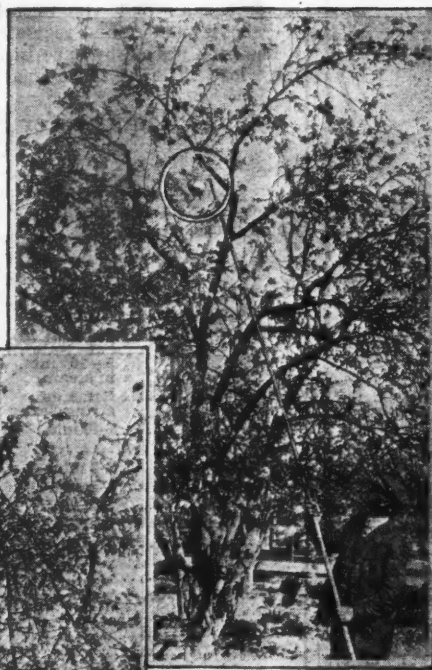
Investigational work by federal entomologists in Washington and California on the use of parasites in codling moth control, indicates that there may be possibilities of reducing moth infestation by this means. It is expected that these investigations will throw considerable light on this matter in the next few years.

Two methods of mechanical control of the adult moth, which are comparatively simple in application, offer the most promise in the average orchard district at the present time. One is the use of banding and scraping. The other is the use of bait traps. Anthony Spuler, entomologist from the Washington State College, who has been stationed at Wenatchee the past two seasons doing codling moth investigation work, has obtained some interesting information on the use of these devices.

Mr. Spuler conducted a number of experiments to get information regarding the habits of mature worms when leaving the apples. During 1926 and 1927, he found that few of the codling moth larvae hibernate in the soil below and away from the tree, but that a high percentage of them either hibernate on trees above ground or a few inches below ground. He tested this out by means of screen cages, covering a portion of the soil under the trees, and found no moths emerging. Cages were placed both on clean cultivated land and on land having an alfalfa cover crop, and no moths emerged in either case.

In order to catch larvae descending trees, bands were placed on the main limbs of the tree. Below these bands fine wire screen was fastened and

Upper picture shows the method of raising and lowering the "hootch trap" by means of a pole with a hook on the end. Anthony Spuler, entomologist of the Washington State College, demonstrating. In the middle picture the trap is suspended from a cross-arm and is raised and lowered by a rope or wire running through two screw-eyes. The lower picture shows how a pall is used. The proper height at which to hang the trap can be seen from these views. The open, shallow receptacle is kept supplied with one of several effective fermented liquids.



coated with a sticky preparation to prevent the worms from the treetop going below the upper bands. A metal shield was placed around the base of the tree, extending about 10 inches away from the trunk. The shield was then sealed to the trunk, and this formed a barrier for all worms seeking to enter the ground from the base of the tree. Above this barrier a corrugated paper band was placed around the trunk. A

careful check of the soil and trees, beneath the tree and on the bands, showed the following results: worms in upper bands, 86 alive, 30 dead; worms in lower bands, 196 alive, six dead; worms in soil beneath trees, none.

In five trees checked for worms, a total of 755 worms were removed. Of this number, 239 were removed by thinning before harvest and 222 were removed at harvest time, leaving a balance of 254 worms which left the apples while the apples were still on the tree. Of this number, 140, or 55 per cent, of the total number of worms which escaped

were caught in the corrugated bands.

Of course, banding without scraping the rough bark off the tree will give very poor results, because many of the larvae will hibernate in rough bark before they reach the bands. In all of these banding experiments, the trees were thoroughly scraped. In this process, all rough bark on trunk and branches must be removed.

Materials which may be used for banding are burlap and corrugated paper. A new treatment of bands with oil or oil solution of beta naphthol which is placed in the bands, apparently kills the worms in the bands and eliminates the necessity of going over the bands so frequently. Under the system which has previously been in operation in our orchards it has been found necessary to look at the bands every 10 days, but the new treatment saves this extra labor.

In connection with Mr. Spuler's experiments, it is interesting to note that 37 per cent of the worms were removed by thinning. This indicates the importance of careful thinning. In recent years many large orchard owners have followed the practice of paying a premium for all worms found at

thinning time. These worms are all first brood worms and are a tremendous factor in keeping down the infestation of moths in the second brood emergence. It is also noted that 30 per cent were removed at harvest time, indicating the necessity of carefully looking after the picking boxes. These boxes should be kept in a closed shed and fumigated to destroy the over-wintering moths.

In the warm districts of the Northwest where the heavier spray program has been followed, two broods are practically always present, and there is some indication that a third brood sometimes has its beginning in a warm fall. Consequently, the battle must be won on the first brood, as entomologists have found that females of the first brood lay an average of 40 eggs apiece and those of the second brood lay as many as 200. Most of the apples injured by the first brood either fall off or are picked off, but those injured by the second brood, even though the larvae are killed by spraying, show stings.

During the past three or four seasons, a number of investigators have taken up the use of fermented bait for attracting codling moth. A number of people have had the idea in mind of catching adult moths with some kind of trap. For several years frequent reports of big catches of insects with light traps and oil attracted attention. In spite of the fact that entomologists have been telling us for a great many years that codling moths are not attracted by light, there are still inventions on the market based on this principle. This method appears to be successful with some forms of insects but entomologists have failed to discover any use for light traps in catching codling moth out in the open orchard.

The "hootch" pot has proved to be astoundingly successful in catching the adult moths. In 1926, Spuler discovered that about 60 per cent of the moths caught were females, and examination showed that a high percentage of them were caught before any eggs were laid.

The use of the moth trap for setting spray dates was practiced to a considerable (To Page 19)

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Chats with the Fruit Grower's Wife

By HAZEL BURSELL

THE PRESERVING of fruits, vegetables and meats for future use by canning can be the source of much pleasure and profit to the housewife, if she uses correct, efficient methods in her work. The woman who has never felt the intense satisfaction that comes from being able to gaze on a neat storeroom filled with row upon row of beautifully canned products has missed something precious in life!

The canning of surplus farm produce not only conserves food which would otherwise be wasted, but also provides a variety of foods for the winter months, thereby making the family healthier and better nourished. Fruits and vegetables are rich in mineral salts and vitamins, necessary body builders and regulators, and it has been proved by experiment that they lose little of these qualities in

at the same time give the best finished product. It is the only way in which foods which are difficult to preserve, such as meats, fish, peas and beans, can be put up. These foods would invariably spoil if canned by the old-fashioned open kettle method, as bacteria would get in from the air while the otherwise sterilized product was being transferred from the kettle to the jars.

In the cold-pack process where the food is put in the jars raw and processed sufficiently afterwards, all bacteria and mold spores are destroyed, and the product is therefore sure to keep. Then, too, the cold-pack method insures a whole, nicely colored and delicately flavored product, which is impossible to obtain by any other method. If you have a

handle for peaches, tomatoes or other produce which needs to be scalded in order to remove the skins; pressure canner or waterbath outfit as described above; labels for jars where the food is dark in color and needs distinguishing marks; and, finally, a boiler or dishpan of scalding water for blanching in the case of vegetables. Inspect rubbers and jars carefully before using, otherwise your work as well as your product may be wasted. Rubbers should be soft and elastic, and jars clean and free from all cracks.

The processes of canning fruits, vegetables and meats are quite different, so it is wise to discuss each problem separately.

Canning of Fruits

The first point in fruit canning is the selection and preparation of the fruit. It should be absolutely fresh and free from spoilage. If the fruit is allowed to stand for some days, or even hours, after being picked, the bacteria, which are always present, have a chance to multiply and will cause trouble later. Farm housewives have all the advantage over their city sisters when it comes to this, for they can pick the fruit and can it the same day.

Slightly underripe fruits give the nicest canned product in most cases. Prunes and plums are best when canned as soon as fully developed but before they begin to soften. Pears, peaches and berries should be sweet and ripe, but not "dead ripe." All soft and tainted portions should be cut away in the larger fruits, while affected small fruits should be discarded altogether. Sometimes over-ripe, bruised (but not spoiled) fruits may be made up into jams and butters economically.

Leave Stones In

The smaller thin-skinned fruits are washed, steamed and put directly into the sterilized jars, even though they may have "stones." I never remove cherry pits (except in the Kentish or tart pie cherry) or the pits from smaller plums—it is a waste of time and energy and succeeds only in spoiling the appearance of the finished product. Neither do I remove the stones from Italian prunes, as both the flavor and appearance are best when left whole. Do not crowd the fruit into the jars, as a more delicate flavor can be secured with an ordinary amount of fruit and plenty of juice.

In the case of the larger fruits, such as pears, apples and peaches, it will be found necessary to peel and cut them up. All pits and cores must come out also. Peach pits usually produce a bitter flavor in the finished product. A sharp silver knife is best for the peeling, as a steel knife may hasten discoloration. Apples for canning may be peeled and sliced on the regular apple peeler, thus saving much valuable time and effort. Peaches should always be placed in a wire basket and immersed in a pan of boiling water for a minute or so (the time depending on the ripeness of the fruit), so that the skins will slip off easily. The latter should be cut in halves, the pits removed, and then they should be arranged neatly in jars. In the case of all fruits which discolor easily, it is essential to pack them in the jars as fast as prepared and then cover them with syrup and water as each jar is filled.

Berries should be put in a colander, dipped quickly in a large pan full of cold water, shaken slightly so

Time Required for Processing Fruits and Vegetables

(Pint or quart jars)

Product.	Blanch.	Water bath at 212° F.	Steam pressure		
			5 lbs. at 228° F.	10 lbs. at 240° F.	15 lbs. at 250° F.
Apples		20 min.	7 min.		
Apple sauce.....		10 min. if hot 20 min. if cold	5 min.		
Apricots	1-2 min.	30 min.	10 min.		
Asparagus	4 min.	180 min.		30-40 min.	
Beans, string.....	3-5 min. in hot water, 5-10 min. in steam.	3-4 hrs.		40-50 min.	
Beans, Lima.....	Same as string beans	250 min.		45-60 min.	
Beets	5-10 min.	2 hrs.	60 min.	40 min.	
Berries		10-20 min.	10 min.		
Carrots	3-5 min.	3 hrs.	60 min.	40 min.	
Corn, sweet.....	1-5 min.	4 to 6 hrs.		90 min.	60 min.
Currents		10-20 min.	10 min.		
Dewberries		10-20 min.	10 min.		
Figs	5 min. in soda	30 min.	25 min.		
Gooseberries		10-20 min.	10 min.		
Gooseberry sauce, hot		10 min.	5 min.		
Grapes		10-20 min.	10 min.		
Greens	4 min. in hot water, 15 min. in steam	4 hrs.		90 min.	35 min.
Guavas	½ min.	25 min.	15 min.		
Huckleberries		10-20 min.	10 min.		
Loganberries		10-20 min.	10 min.		
Peaches	1 min.	30 min.	15 min.		
Pears		30 min.	15 min.		
Peas	3-8 min.	4 hrs.		40-50 min.	
Peppers	6-8 min. in oven	30 min.			
Pineapple		30 min.	10 min.		
Plums		20-30 min.	12 min.		
Pumpkin	10-15 min. in steam	3 hrs.		40-60 min.	
Prunes		30 min.	15 min.		
Raspberries		10-15 min.	10 min.		
Rhubarb		20 min.	10 min.		
Rhubarb sauce, packed hot.....		15 min.	10 min.		
Spinach	4 min. in hot water, 15 min. in steam	4 hrs.		90 min.	35 min.
Squash, winter.....	10-15 min. in steam	3 hrs.		40-60 min.	
Strawberries		10-20 min.	10 min.		
Sweet potatoes.....	10-15 min.	3-4 hrs.		70 min.	60 min.
Tomatoes	1-1½ min.	25 min.	15 min.		
Tomato puree.....		25 min.	15 min.		
Vegetable mixture..	5 min.	3-4 hrs.		30 min.	

the canning process. Canning, when properly done, is the most desirable means of preserving fruits and vegetables, as it keeps them in a condition more nearly like that of the freshly-cooked products than is the case with dried, brined or pickled foodstuffs. Another point worth considering is that when the canning is done, the food thus preserved is practically ready to serve. A variety of "emergency dishes" is thereby insured.

Cold Pack Method Best

The process we are going to discuss is the one-period cold-pack method. This method has been found to save time, labor and materials and

pressure canner in which to do the processing, that's fine, but a home-made water bath outfit, consisting of a tight-lidded wash boiler fitted with a slatted wooden rack for the jars, will serve the purpose just as well. The writer has always used the latter method with excellent results.

Equipment Is Listed

The first thing to do is to assemble the needed equipment. Here is a list of the essentials: jars, rubbers and lids—washed and scalded; water for washing, etc.; sugar and syrup kettle, if for fruits; salt and pepper, if for vegetables or meats; measuring cups and spoons, sharp knives for cutting and peeling; wire basket with

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that leaves and grass seeds will float and can be skimmed off, and then drained at once. Put the drained fruit directly into the jars.

Don't Oversweeten Fruit

Syrup and not dry sugar should be used in sweetening canned fruit. It should be prepared before the actual preparation of the fruit is started. In my canning work, I use only enough sugar to bring out the natural flavor of the fruit and take away the excess acid—one-half cup of sugar to the quart of fruit in most cases. Prunes and sweet cherries require very little sugar, one-half to three-fourths cup to the half gallon being sufficient. For peaches, plums and Loganberries, however, I use about three-fourths cup of sugar to the quart of fruit. Pears also need to be quite sweet in order to bring out their best flavor. Remember that it is better to undersweeten than to oversweeten.

Measure out sufficient sugar for one boiler full of jars, place in a large preserving kettle, and pour over sufficient water to dissolve it well. Bring to a boil, skim off any scum which forms, and cool. When easily discolored fruit is being canned, measure the water in the syrup exactly, so that the syrup can be apportioned jar by jar as they are filled. When this is not necessary, the syrup can merely be divided equally among the jars after all are full. When the correct amount of syrup has been added, then the jar should be filled to the top with cold water.

Next put the rubbers and lids in place, but do not seal the jars completely with either the glass-top or screw-top jars. This permits the steam to escape. The self-sealing jars will, of course, have their lids clamped on tightly during the whole sterilizing process. The lids of the glass-top and screw-top jars will be sealed down just as the fruit is taken out of the water bath.

I always stand the jars (except the self-sealing ones) on their heads after sealing to see if, by any chance, there is a leak—shown by bubbles continuing to rise from one certain spot in the lid. It is best to let screw-top jars cool while standing on their heads, as this assists with the sterilization in the case of fruits with a very short cooking time. Do not allow a draft to strike the hot jars, and do not set them on a cold, wet surface, or there will be some loss from breakage.

It is necessary to guard against the over-cooking of fruits, as too long cooking causes them to shrink, to lose their color and shape and some of their "fresh fruit" flavor. Especially is this true of berries which require only a few minutes of cooking, as shown by the time table. For exhibition purposes, the writer has cooked raspberries in a covered pan of hot water resting on a table. Self-sealing jars and hot syrup were used, of course. A wrapped hot iron was placed on the lid of the jar finally to insure a perfect seal. The berries were ruby colored, and each berry floated separately and distinctly in an even distribution through the syrup. They were much admired and were pronounced perfect. In general, it is safe to remove the jars from the water bath just as soon as the fruit begins to shrink from the bottom.

Other points to remember in fruit canning are to have the water in the water bath approximately the same temperature as the syrup in the jars to avoid breakage, and to have the water in the water bath come up to the necks of the jars. After the water boils and the fruit is hot, it is not wise to maintain too hot a fire, as extremely rapid boiling may cause

unnecessary shrinking from the bottom. A steady fire that just maintains the boiling temperature for the indicated period is most desirable; never crowd any kind of fruit into the jars to secure the best flavor and appearance.

The preparation of the fruit and the filling of the jars is the same for canning in the pressure cooker as for the water bath method. The only difference is in the method and amount of time for sterilization. Of course, the pressure canner sterilizes in a much shorter time, because of the higher temperature provided. On the other hand, not nearly as many jars can be cooked at one time as

can be in the wash boiler sterilizer. In the pressure cooker a small amount of water is used—just enough to generate steam for the cooking process. Special instructions come with each brand of cooker. Strict attention must be paid to the time table when canning with the pressure canner, as the fruit may be vastly overcooked in a very short over-time period. The pressure stabilizer should be set at the indicated pressure for that particular fruit before steam starts to generate.

When the fruit is canned and cool, the jar lids and jars should be polished, dark fruits which are not easily distinguished from other varieties

should be neatly labeled, then the jars should be stored in a cool, dry, dark place.

Due to space limitations we shall be compelled to postpone our discussion of the canning of vegetables and meats till the August issue of the AMERICAN FRUIT GROWER MAGAZINE.

The necessary period for the sterilization of the various common fruits and vegetables as advised by the United States Department of Agriculture in their bulletins are given in the accompanying table. Temperatures and periods of time best suited for each type are given for both the pressure canner and the water bath methods.

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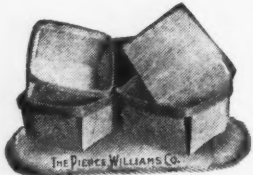
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The Market Review

By PAUL FROEHLICH

United States Bureau of Agricultural Economics

JUNE was an exceptionally active month for cantaloupe and vegetables, especially potatoes. July promises to be heavy on peaches, watermelons, pears and other early deciduous fruits. Mid-season potatoes also will be moving in large volume. Strawberries were ending their season with a lighter crop than originally expected in the late-shipping states. Prices of nearly all fruits and vegetables were relatively low, as carlot movement has been heavy. Shipments of citrus fruit, however, were approaching their lowest point of the entire year.

Good Crop of Peaches

Based on June 1 condition indicating 73 per cent of a normal crop, total peach production looked like 64,186,000 bushels. Last year's light crop was only 45,463,000, but the big crop of 1926 totaled 69,865,000 bushels. Average for the five years, 1923 to 1927, was 52,224,000 bushels. Prospects are poorest in the intermediate group of states from Delaware through the Ohio Valley to Missouri. The southeastern states seem likely to have an exceptionally heavy crop, and the same is true in California. In the northern peach areas, it is too early for a reliable forecast, but present prospects in these states point to a crop intermediate between the light production of last season and the very large crop of 1926.

Georgia, with an expected crop of 10,000,000 bushels, may have two-thirds more peaches than in 1927 and slightly more than in 1926. North Carolina, with possibly 2,450,000 bushels, would have almost twice as many peaches as last season and would also exceed its 1926 record. South Carolina expects a large crop. Ohio and Illinois will scarcely exceed last year's light production, but Arkansas anticipates considerably more fruit than in 1927 though not quite so much as two years ago. New York appears to be going to have three-fourths heavier production than last season; Pennsylvania may show a gain of fully 50 per cent, but New Jersey will likely fall below its 1927 record. Tennessee and Alabama should fully equal if not surpass their 1926 figures. Texas, though doing much better than last year, may not have much over half its 1926 total. Utah shows a gradual increase during recent seasons, but Colorado does not expect to harvest as many peaches as in 1927 or 1926. Washington should be nearly back to normal, following its very light crop of last year. California expects a bumper crop of 25,000,000 bushels. Nine western states together may have 28,233,000 bushels, or 45 per cent of the total production, whereas last year the West had about half the total.

A forecast of the commercial peach crop in Georgia indicates possibly 17,000 cars, as against shipments of 12,000 last season and 17,950 in 1926. The increase over last year will be mostly in territory north of Macon, where the spring freeze in 1927 did so much damage. All varieties but Georgia Belles are expected to show heavier production this year. Hileys will have the largest percentage increase, and Elbertas probably will be 45 per cent heavier than in 1927. The shipping season opened on May 30, about two weeks later than in 1927,

and 50 cars had rolled by June 10, compared with 500 at the same time last season. Active movement of Unedas was expected during the middle of June, with Early Rose and Carmans following in order a week or two later. The southern district of Georgia may have 8200 cars of peaches, compared with 7535 last year. Central district expects 7000 cars, as against 4435 in 1927, and the northern part of the state probably will have a crop of 1800 carloads. Last season only 60 cars came from north Georgia. Shipments will be graded very carefully this year, and good fruit probably will find a favorable market, in spite of the heavier production. The state law requires that every package shall bear the name of the grower or shipper and also a half-cent tax stamp. Each package must be marked to show the grade, variety and size. Shipping-point inspection will be in force as in past years.

Early arrivals of Georgia Mayflowers were jobbing around \$4 per six-basket crate in New York City, while Washington reported \$3 on first receipts from North Carolina. Shipments from North Carolina started on June 6, compared with May 23 in 1927. A special mimeographed report, entitled "Peaches in 1928," is available from the Federal Bureau of Agricultural Economics, Washington, D. C.

More Pears Expected

California pears began moving during June and should reach their peak in late July. Oregon and Washington pears will follow very shortly. The total crop, according to June 1 condition, is forecast at 23,130,000 bushels, compared with 18,072,000 last season, 25,249,000 in 1926, and an average of 20,150,000 bushels during the last five years. Condition on June 1 was 70 per cent of normal; a year ago condition was estimated at 57 per cent.

About 15,000,000 bushels, or two-thirds the total production, is expected in western states. California may have a huge crop of 9,415,000 bushels. Washington expects 3,000,000 or twice as many as in 1927 and almost as many as in 1926. Oregon, with an anticipated crop of 1,800,000 bushels, will fall slightly below its record of the last two years. Colorado's crop may be a little lighter than last season's. Illinois probably will increase to 500,000 bushels this year but will fall far short of its 1926 total. Michigan expects a slightly heavier crop than in 1927 and may have 780,000 bushels. If New York realizes its forecast of 2,250,000 bushels of pears, it will have one-fifth more than last season and one-tenth more than in 1926.

Apple Prospects

The June 1 condition of apples was about 72 per cent of normal, compared with 57 per cent a year ago, 78 per cent on June 1, 1926, and a 10-year average condition of 68 per cent. With the trees still in bloom on June 1 in some important northern sections, it was too early to forecast the United States crop, but prospects seem to be fairly good in nearly all sections except portions of Missouri, Arkansas, Nebraska, Kansas, Oklahoma, and Texas, where late frost caused extensive damage. California and some of the mountain states expect apple crops larger than were harvested in 1926. Other states report prospects intermediate between the very large

crop of 1926 and the generally short crop of 1927.

Prices of the 1927 crop held up well to the end of the season. Summer apples are already moving from a few states. Good export markets are anticipated during the coming season. General economic conditions in Europe have a slightly more optimistic appearance than was the case last year. It is probable that the demand for American fruits will be more nearly normal than in 1927, when Great Britain was feeling the after-effects of the cessation in industry during the preceding year. Generally good crop conditions prevailed this spring in England and on the Continent. However, apple settings were rather light in northern Germany and the Rhineland. The fruit season is somewhat backward.

Holdings of apples in commercial cold storage plants on June 1 were 121,000 barrels, 1,211,000 boxes and 222,000 bushel baskets. The supply of barreled apples was 47 per cent lighter than a year ago and 55 per cent less than the five-year average for June 1. Boxes in cold storage were 70 per cent more plentiful than last year and 60 per cent above the average figure. The holdings in bushel baskets were only 12 per cent greater than a year ago. Total cold storage stocks were 12 per cent heavier than in 1927 and 15 per cent above average.

Condition of Other Fruits

Florida oranges showed a condition of 80 per cent on June 1, compared with 57 per cent a year ago and 84 per cent on the first of June, 1926. Grapefruit declined during May and registered only 76 per cent in June, but was still 24 points higher than a year ago. Limes held the same relative position as grapefruit, but pineapples were doing better than in either of the last two seasons. A heavy crop of California oranges is indicated by the June condition figure of 95 per cent. At the same time last year the condition was 79 and in 1926 it was 87. Lemons, with a condition of 87 per cent, were faring better than in 1927 but not so well as two years ago. California cherries registered 62 per cent, as against 47 a year ago and 70 in 1926. Plums should be a fairly heavy crop with condition indicated at 83 per cent, or 16 points higher than last summer. Apricots showed poorest condition of all California fruits. Both apricots and prunes were in a less favorable position than last season, with June condition estimated at 55 and 71 respectively. Almost a full crop of grapes may be produced in California, if recent favorable growing conditions continue. Condition of raisin grapes is indicated at 100 per cent, while table and wine varieties showed a condition of 96 on June 1. The range for these three classes a year ago was 87 to 92 per cent. If present prospects are fulfilled, it will mean an immense tonnage of California grapes this season. About 1000 cars of California cherries had been shipped by June 10, and approximately 500 cars of plums and prunes. Early movement was much heavier than last season. A few carloads of Oregon and Washington cherries and some Georgia plums are already moving to market.

Berry Crop Breaks Record

Commercial strawberry production this year shattered all previous records, and is now estimated at 376,052,000 quarts, or about 35,000,000 more than the high total established in 1927. The berry crop in 10 intermediate states is forecast at 138,000,000 quarts, compared with 112,350,000 last year. Missouri, Illinois, Maryland and Delaware expect heavy gains. Average yield per acre in Missouri was indicated as 1560 quarts, or nearly two

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thirds more than last season. According to the original forecast, Missouri's total production was expected to be 42,000,000 quarts; Maryland may have 34,000,000, and Kentucky, Delaware and New Jersey 12,000,000 to 13,000,000 each. Illinois anticipated a crop of nearly 6,000,000 quarts. Estimates for the early, second-early and intermediate crops together approximate 300,000,000 quarts, or one-fourth more than in 1927, even though the acreage is only eight per cent greater.

Production of strawberries in eight late shipping states may be only 77,500,000 quarts, as against 99,500,000 last year. Combined acreage was slightly increased, but certain states—mainly New York, Pennsylvania, Wisconsin, Oregon and Washington—expect a great reduction in average yields per acre, and thus the total output of late berries will be less than in 1927. Average yields last season were 2600 quarts, but only 1900 quarts per acre are now expected. Ohio and Utah anticipate heavier crops than in 1927. Michigan and Oregon will be nearly the same as last year, but New York expects a decrease of one-third, Pennsylvania a decrease of one-fifth, Wisconsin a decrease of two-fifths, and Washington a decrease of about 50 per cent. Washington and Oregon together may have 38,000,000 quarts, compared with 53,000,000 last season.

By mid-June, about 17,500 cars of berries had been shipped, in addition to heavy movement by truck, particularly from the Eastern Shore peninsula. There were still many berries to come from the late states, and the season total should be considerably over 18,000 cars. Wholesale prices were very low during the peak shipments in early June, ranging down to five cents on a quart basis. May shipments broke all previous records for that month and exceeded 11,000 cars. About 3500 cars moved by rail and possibly 800 carloads by truck during the peak week, ending June 2. Eastern producing sections reported a general average of around \$2 per 32-quart crate, cash to growers. Any strawberry growers who realized poor returns will remember the warning in the outlook report of last January that "the berry crop this year will be one of the largest on record."

Treatment for

Ivy Poisoning

THE BEST REMEDY for ivy poisoning is a solution of permanganate of potash to stop the itching, blistering irritation that follows contact with poison ivy, poison oak or poison sumac. Dissolve one part of the permanganate in 20 parts of water by weight. Bathe the skin in this solution, using cotton or soft cloth. The poison will be oxidized and destroyed. A brown stain will be left on the skin, which can be removed readily with a one per cent solution of oxalic acid or a one per cent solution of sodium bisulphide or just plain soap and water. The oxalic acid is a mild poison and the soap and water are somewhat slow in action. Perhaps the sodium bisulphide is the best of the three.

The permanganate treatment is a remedy for poisoning which has already occurred. Persons who are going into the woods or fields and who fear they may be poisoned can prevent the same by washing all exposed parts with a five per cent solution of ferric chloride in a 50-50 mixture of water and glycerine. This should be washed on all exposed parts and allowed to remain there.

If the purity of water is doubtful, the water should be boiled before being used. Water carries many disease germs; clear water is not necessarily pure.

More Quality and Less Quantity

By C. L. BURKHOLDER

Purdue Experiment Station.

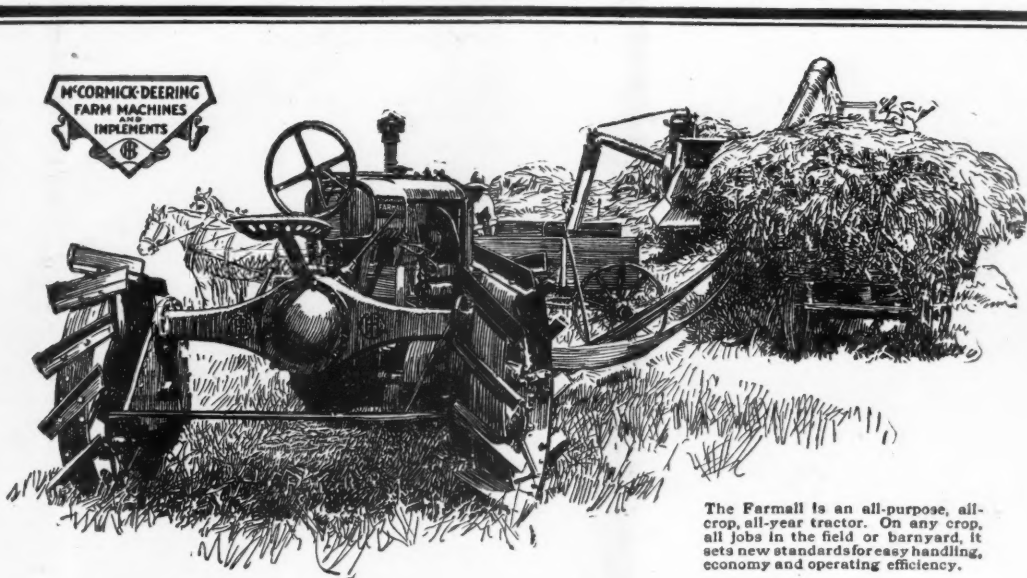
THE BEST of regulated apple orchards produce some fruit which should not go into a commercial pack. The apple growers of Oregon and Washington have made an enviable place for themselves on eastern markets, partly because they have either dumped the low grade apples or have used them up in by-products. The growers in the East and Middle West have usually found a ready sale for off-grade fruit, cider and vinegar in nearby markets. In recent years, this has been more difficult to do.

One very evident remedy would be to grow less second-grade apples. More attention to proper thinning and heavier pruning is unquestionably a

safe and sane step in the right direction. A recent tour through the main apple producing sections of the Pacific Northwest convinced the writer that these men were right in giving increased attention to these two things. Quality and not quantity was being emphasized in the growing methods as well as in the packing shed. Where there is still a reliable yearly demand for number two and cider stock, a grower might still be justified in continuing to grow "bushels" rather than cutting down on quantity with an eye to increasing quality. On the other hand, few big industries can continue in a prosperous healthy condition very long without

progress. The buying public has made big progress in recent years. It has learned to appreciate and demand better grown and packed fruits. The low prices of a year ago and the rather dull markets of the past winter in spite of a short crop, are danger signals that might well be heeded.

Possibly there are enough apple orchards now in bearing to over-supply the present demand in years of heavy crops in both the eastern and western apple producing sections. Whether or not this is the real cause of low prices in recent years, it would be wise for every grower to pay more attention to economical methods of increasing the percentage of first-grade apples.



The Farmall is an all-purpose, all-crop, all-year tractor. On any crop, all jobs in the field or barnyard, it sets new standards for easy handling, economy and operating efficiency.

Farm with Farmalls!

The McCormick-Deering 15-30 for larger operations

The view below shows the larger International Harvester Tractor, the McCormick-Deering 15-30. Plenty of power for fast-rate plowing—3 furrows, 4 in some soils. Abundant belt power for the larger threshers, ensilage cutters, etc. On many farms the all-purpose Farmall and the more powerful 15-30 are working together. The McCormick-Deering line also includes the popular 10-20 tractor, a smaller edition of the 15-30.

POWER

for every farm need... at the McCormick-Deering dealer's



NO wonder this tractor is popular—the Farmall for the first time gave the farmer a real all-purpose tractor. It is ideal power for all crops, all fields, all jobs, and all the time. There is no off-season for the Farmall.

The Farmall is the ideal tractor for every power machine in its power range—whether it runs by draw-bar, belt, or power take-off. Its wide tread, extra-high row clearance, and other special features of design fit it perfectly for planting and cultivating of corn and cotton and other row crops.

The Farmall and its equipment will show you a better, handier, more economical and more profitable way to farm. Ask the dealer to demonstrate. Write us, now, for the complete catalog. **Farm with a Farmall!**

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includes 2 and 4-row planters and cultivators, 7-foot mowers and 7-foot trailer mowers, middle-busters, 4-row lister cultivators, sweep rakes, beet tools, potato tools, etc. It plows two perfect furrows; it cannot be beat at the belt. A good time to use it is now!

Pipe Smoker Finds Pep-Producer and Solace All in One

**This tobacco gives him added vigor
in his daily work, then soothes
him when the day is done**

When a man has a good pipe and the right tobacco, he has a true and helpful friend. Never was there a more convincing illustration of this fact than the following letter from Mr. Arbogast. Here is a gentleman whose work makes a constant drain upon his nervous energy, and all day long his faithful pipe and favorite tobacco help him produce pep.

Then, at the day's end, the soothing fragrance of his favorite pipe-smoke wipes all cares away. Here's what he says:

Cincinnati, Ohio,
June 1, 1927.

Larus & Bro. Co.,
Richmond, Va.
Gentlemen:

My good old pipe has just reminded me of a dozen promises to write a bit of appreciation of its affinity—Edgeworth.

Fate, kind or otherwise, has drawn me into a line of work that calls for the very utmost expenditure of nervous energy, tact, and perseverance. I can think of many more pleasant things than conducting fund-raising campaigns for hospitals, churches, etc.

When you are up against a barrage of questions by excitable women, doubtful men, and self-confident millionaires, trying to harmonize the whole in an effort to raise thousands of dollars where none grew before—well, you need a Pep-Producer—that's all.

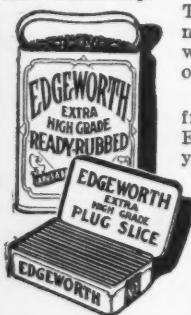
And when the day's work is done, along toward midnight, what a blessed solace comes with the first draw of Edgeworth. Then my pipe and I hold a real conference, and the obstacles fade away with the smoke. Then we wonder why they should have bothered us at all.

I feel qualified to speak because a can a day is my measure of appreciation. The old pipe O. K.'s this letter and insists that without Edgeworth we could not have raised the thousands of dollars we did.

Good old Hed! Good old Edgeworth!
Sincerely yours,
William H. Arbogast.

Let a man find the right tobacco, and his pipe sure does become a true and faithful friend—a constant companion through his sorrows and his joys. It is ready to encourage him during the day's excitement, there to soothe him in the quiet evening hours when a pipe, a book, and an easy chair make the world a pleasant place to live.

As a pipe "affinity" (which Mr. Arbogast so aptly calls it) Edgeworth has brought many a man and pipe together for a grand and glorious lifetime friendship.



To those who have never tried Edgeworth, we make this offer:

Let us send you free samples of Edgeworth so that you may put it to the pipe test. If you like the samples, you'll like Edgeworth wherever and whenever you buy it, for it never changes in quality.

Write your name and address to Larus & Brother Company, 13 S. 21st Street, Richmond, Va.

Edgeworth is sold in various sizes to suit the needs and means of all purchasers. Both Edgeworth Plug Slice and Edgeworth Ready-Rubbed are packed in small, pocket-size packages, in handsome humidor holding a pound, and also in several handy in-between sizes.

On your radio—tune in on WRVA, Richmond, Va.—the Edgeworth station. Wave length 254.1 meters. Frequency 1180 kilocycles.

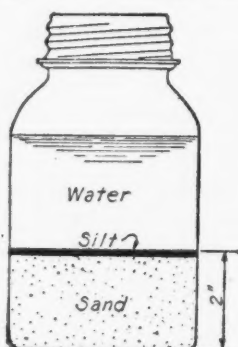
Fruit Farm Engineering

By E. W. LEHMANN

Good Materials Essential to Good Concrete

NEARLY every farmer has a job of concrete work to do some time. The quality of cement, if it is fresh, is good because it is carefully made to conform to a standard, but what about the other materials that go to make concrete? Much concrete fails due to lack of care at this point. It is as illogical to try to make good concrete out of dirty sand and gravel containing foreign matter as it is to make a high grade cake out of inferior flour.

The reason sand should be clean for concrete work is that fine dust, clay, loam or vegetable matter prevents the proper adhesion of the cement to the sand and gravel. It is also true that concrete made with dirty



sand or pebbles hardens very slowly and its strength is greatly reduced.

Before using dirty appearing sand for making concrete, it is best to test it to be sure that it is satisfactory. A close approximation of the amount of clay and other foreign material in sand can be readily determined by the following simple test, using only a quart jar for equipment:

Get a representative sample by taking a small quantity of sand from the supply at several different places and mix it thoroughly. From this sample fill the jar to a depth of two inches. Add water until the jar is about three-fourths full and shake vigorously for at least one minute, the last few shakes being in a sidewise direction to level off the sand. Allow the jar to stand for an hour or more, during which time the clay and silt will be deposited in a layer above the sand. If this layer is more than one-eighth of an inch thick, to make the sand suitable for concrete work it is necessary that it be washed to remove the excess silt.

Buying a Tractor

BEFORE I would seriously consider the purchase of a tractor I would want to be sure that the dealer from whom I make my purchase would stand ready to give me service in parts whenever I needed any parts. I would also expect service from the manufacturer. I would not expect free service. I would not consider buying the most perfect machine on the market if service were not available.

As to the machine itself, it should be adaptable to my needs. For orchard work I would want a machine that could be operated under the trees with the least damage. For general farming I would want a machine that could be used in planting and cultivating as well as plowing. I would want a machine that is dependable, a machine that had already established a good

record for giving good service with a minimum of expense.

I would want a machine that is easy to handle, and easy to service. I would not want a tractor that was hard to steer or hard to get lined up for belt work. The fourth requirement would be durability, and if durable and dependable, it should be economical, the fifth requirement, economical in fuel and oil used, in maintenance and in repairs.

The sixth requirement would be accessibility. Adjustments should be easy to make and replacement should be made without difficulty. The modern tractors are more accessible now than the earlier designs.

The seventh requirement would be reasonable first cost. However, if the tractor met the first six requirements, the matter of first cost would not be so important. I could afford to pay more for the tractor that met my needs, is dependable, easy to handle, is durable and is economical to operate. I recognize the fact that a quality machine will cost more than one of poorer grade.

Finally, I would want a machine that is comfortable to the operator, and of good appearance. The fact that a tractor is a utility machine and is not operated primarily for pleasure the appearance is of minor importance. However, comfort should not be overlooked; it would be partly considered under the requirement of ease of handling.

Lack of Power in a Gas Engine

THE GASOLINE MOTOR is a much better machine now from a mechanical standpoint than it was a few years ago. The recent achievement of the aviators in their non-stop flights of over 3000 miles is some indication of this progress in gas engine construction and design. Many automobile motors operate 20,000 miles or more without any mechanical adjustment. Tractors also operate for whole seasons without mechanical trouble. Although much progress has been made, a cause of lack of power in gas engines is the mechanical condition of the motor itself. In examining a motor that does not develop power, do not be too quick to condemn the ignition system or the carburetor; better see if the motor has good compression and the valves operate properly.

Poor compression will reduce the power that an engine may develop. Poor compression may be due to any one of a number of causes. Leakage around the piston may be due to worn or broken rings. In some cases the trouble is due to scored cylinders; the remedy may be rebored cylinders and over-sized pistons.

If the valves do not open and close at the proper time, or do not open as fully as they should, the engine cannot develop its full power because it does not get a full charge. The timing is usually fixed so that it cannot be changed without taking the engine apart, but it sometimes happens that the adjusting nuts or screws on the push rods have not been properly tightened and they allow the push rod to shorten during operation. Then the valves do not open as soon as they should nor to their full extent.

In order to get the maximum power from an engine, the valves must be

properly timed. For best results, the hot burning gas must be prevented from escaping from the combustion chamber until nearly the end of the power stroke.

While improper valve adjustment will cause loss of power, sticking valves may be the cause of trouble. Worn valves or valve stems should be replaced. Valve seats should be cleaned and ground if necessary, to get good compression.

An engine that pounds and knocks should be looked after to avoid damage that cannot be repaired. While pounding may be due to other causes, such as spark too far advanced, and pre-ignition due to carbon deposit, the most common cause is loose connecting rod bearings, and main shaft bearings. A loose fly wheel will also cause an engine to pound.

In timing or adjusting valves, especially on a tractor or automobile motor, it is well to follow carefully the instructions provided by the manufacturer in the instruction book. The better built motors require very little mechanical adjustment if they are handled carefully and lubricated properly.

What Makes the Kitchen Drain Clog Up

AT REGULAR intervals I receive inquiries asking for information on how to keep the kitchen drain from clogging. I have an inquiry from a county agent before me which prompts me to say a few words about the most common causes of a kitchen drain clogging. Probably the most common causes are: The use of improper materials for the drain, improper construction of the drain, and finally a poor outlet.

A drain made of porous tile or of ordinary farm drain tile is not satisfactory for taking care of drainage from the kitchen sink on account of the fact that the liquids will seep through the joints of the tile and allow the solids or grease to settle out and gradually fill up the drain. A good grade bell-mouth sewer tile with cemented joints will make a good drain which can be constructed by a farmer.

In some instances, the trouble of clogging cannot be accounted for by the kind of drain but by improper construction. The grade should be uniform and have a reasonable fall. A tile laid with only a few inches fall per hundred feet is liable to stop up because the rate of flow of the liquids is slight and the sediment carried in the waste water settles out. The best practice is to give the tile as much fall as is possible. In case the tile must be laid on a low grade, the practice should be followed of running a considerable quantity of water through it at regular intervals to flush it out. A tile laid on an uneven grade is also liable to give trouble.

The outlet is always an important consideration. To discharge the waste water from the kitchen sink into a small farm drain may be inviting trouble, especially if the outlet tile is one which does not carry much water; such an outlet is liable to stop up. If the discharge is into a larger drain carrying considerable water, no trouble will result. If a septic tank is available, the kitchen wastes should be discharged into the sewer carrying the other wastes to the tank from the bathroom and toilet. Under conditions where it is difficult to secure a good outlet and when no septic tank is available, then it may be necessary to provide a cesspool for the kitchen wastes. The best plan is to provide a complete system with a septic tank. The discharge from such a tank can be taken care of without clogging the tile.

Fruit Farm Beekeeping

By HARLEY F. WILSON

Preparing for Next Year's Honey Crop

ABOUT July first of each year is the time when every beekeeper should begin preparations for securing a maximum crop of honey in the next season. To secure bees for the honey crop, one must have bees in the spring. To have bees in the spring, the colony must contain an abundance of young bees in the fall, and these young bees must be reared in September and October. Bees produced in August are old bees by fall and are not the most satisfactory for carrying the colony through the winter and for building up the colony in the spring.

One important factor in securing young bees in the fall is a young queen, reared in the latter part of July or the first part of August. Beekeepers are generally agreed that a queen more than two years old has passed her prime and should not be held over for the third year. Whether or not a queen should be kept over two years depends entirely upon the condition of the colony the first year. If a queen has an opportunity to lay to full capacity during the first year, she is not likely to be as strong in the second year. But, if the colony is weak during the first egg laying season and the queen does not have an opportunity to lay eggs to her full capacity, she should then be suitable for a second year.

One of the important needs for the rearing of bees in the fall is an abundance of stores. Beekeepers who strip the colony down to just sufficient honey for the bees to maintain themselves will find that young bees cannot be reared except in those localities where there is always a heavy fall flow. If the summer flow has been short and no fall flow occurs, then sugar syrup must be fed to provide adequate stores for the fall broodrearing period.

How to Requeen

TWO METHODS of requeening colonies are open to the beekeeper. If the beekeeper does not care to follow out queenrearing in his own yard, he can buy the queens from some southern breeder and introduce them by the method recommended on the shipping package or by some other method which he knows to be reliable. Queenrearing by the amateur beekeeper can be successfully done if the beekeeper will prepare himself beforehand by reading one of the books on queenrearing.

A simple and very effective method which may be used with reasonable success where no effort is being made to improve the stock is to go through the colonies about the middle of July and destroy the old queens. If this procedure is followed out at that time, the end of the honey flow will probably come before the queens emerge and the chances for swarming through dual emergence will be greatly reduced. About three weeks after destroying the old queens, the beekeeper should go through each colony to determine whether or not the new queens are present and are laying. If they are not found laying by that time, the queens probably have been lost during the mating flight and some provision should be made for provid-

ing new queen cells or a young queen from a nucleus.

There is not a great deal of danger of losing queens during the mating flight, but, in order to provide protection against loss of queens in this manner, the beekeeper can start a few nuclei at the beginning of the honey flow and rear queens that will be mated and laying about the time the queens in the old colonies are destroyed. The method of starting such nuclei is to make them up at the time when manipulations are being made in supering for the honey flow. One, two or three frames of brood, taken from the original colony and started as a nucleus, will serve for the queenrearing unit. Eggs and larvae of all

stages should be present in at least one of the combs. For those beekeepers who wish to become thoroughly informed on the subject of queenrearing, we suggest that they secure a copy of one of the following books: F. C. Pellett's "Queenrearing" or Jay Smith's "Queenrearing." These books can be secured through any bee supply dealer.

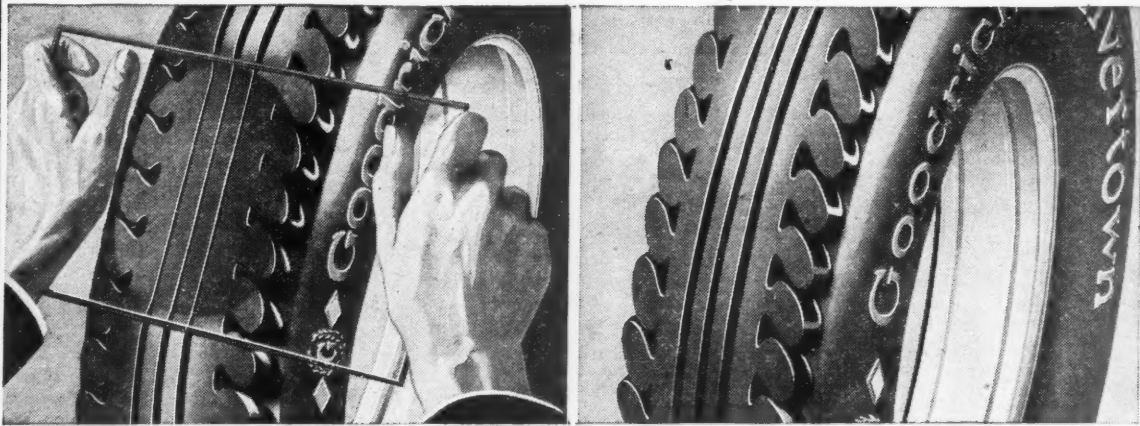
Care of Surplus Combs

TO MAKE beekeeping profitable, the beekeeper must pay attention to details in saving his equipment. Both brood and extracting combs are equipment and should be handled and preserved with care. Supers containing brood combs, either empty or with honey, should be stored in a moth-tight room and occasionally examined to see if they are infested with moths. Extracting combs should be put back on the hives as soon as the extracting is done, and may be left there until early fall or may be carried into the store house.

All combs in the store house should be examined occasionally, and if moths are present, they should be treated with carbon bisulphide at the rate of one ounce to every five hive bodies. Be sure that the hive bodies fit tightly and are covered, so that the fumes of the carbon bisulphide will not escape until the fumigation is completed.

Carbon bisulphide is explosive and therefore no fire or light of any kind should be allowed in the room where the fumigation is being done during the fumigation period.

In sections where there is no fall honey flow, the queen should be held to a lower hive body with a queen excluder above. If this is not done, broodrearing will probably be carried on in the upper chamber, and the combs in the lower hive body will be filled with pollen. The beekeeper will find it very difficult to get the pollen out of the combs, and if the pollen becomes hard and solid, as it sometimes does, it may be necessary to destroy the combs.



By this easy test

You can see why Silvertowns
are making new mileage records!

ABOVE is a Goodrich Silvertown "in action." Beneath the plate glass is the tread just as it would look in that fleeting instant when it rushes against the road.

Compare the tread under pressure with the tread on the right.

Note, above, how the grooves can close up—easily, smoothly, without harmful tread distortion.

Then glance at the edges of the tread—the shoulders—and see how

those heavy safety blocks come against the road with full, firm contact.

Perhaps this does not seem so important. But remember, what you see here happens close to 300 times a minute when you drive 30 miles an hour.

That is why the balloon tread, to be successful, must have a flexible center. It is the reason Goodrich Silvertowns have proved so remarkably free from uneven, choppy tread wear. They give your car comfort, safety, silent traction and smart appearance, combined with true economy.

Goodrich Silvertowns

Goodrich Silvertowns Deserve
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Inform Yourself About Home Conveniences

Do you follow the splendid plan of adding some Home Convenience every year? Unless you do, you are not giving yourself and your family the continually improved standard of living to which they and you are entitled.

Read over the list of Home Conveniences below. Check the ones in which you might be interested now. We will forward your inquiry to a few reliable manufacturers who will be glad to send you Descriptive Literature and prices, without obligation except that you will give serious consideration to the literature received.

Check the items. Write your name and address very plainly and send this coupon to:

Buyers' Service Bureau, American Fruit Grower Magazine,
53 W. Jackson Boulevard, Chicago, Ill.

Gentlemen: I am interested in the subjects checked below:

- ☐ Electric Lighting Plant, ☐ Carbide Gas Plant, ☐ Gasoline Lamps, ☐ Vapor Stove,
☐ Warm Air Furnace, ☐ Hot Water or ☐ Steam Heating System, ☐ Bathroom Equip-
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Coverings, ☐ Paint, ☐ Varnish, ☐ Cold Water Paints.

Name

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Insects Check Peach Pests

THERE are several insects that assist materially in checking multiplication of peach insects, says the Bureau of Entomology of the United States Department of Agriculture. Ladybird beetles are perhaps the most beneficial of these. They prey upon scale insects, aphids, and thrips. The twice-stabbed ladybird beetle is usually prevalent on peach trees that are heavily infested with the San José scale. It is jet black in color and has two orange or red spots on the back. Ladybird beetles take their nourishment by sucking scale insects dry. They also assist materially in checking infestations of the rusty-brown plum aphid or other aphids.

The adult and young ladybird beetles are sometimes erroneously thought to be the parents of aphids on account of their close relation with these pests. Peach growers should encourage the multiplication of twice-stabbed and other ladybird beetles.

Syrphus flies, lacewing flies, tachina flies, ground beetles, and some of the assassin bugs and preying mantids are other insects that are beneficial to the peach grower. Predacious and parasitic insects give considerable aid in controlling peach insects, and without the help of these beneficial insects it would be very difficult to grow a crop of peaches, even though artificial control measures were enforced.

Fruit Farm Poultry

By RALSTON R. HANNAS

Hot Weather in the Flock

THE EXTREMELY hot days that are likely to occur during July are very hard on the layers, particularly if the layers are overheavy. Where these hot days are anticipated, however, and certain precautions taken, much loss can be avoided.

Birds that are affected with the heat, that is, prostrated, will be seen crouching on the floor with wings outspread and panting heavily. If they have not been noticed in time, they will be found lying on the floor gasping for air. They are sometimes found prostrated on the nests, especially where trap-nesting is being practiced. This is because the nests are usually hotter than the rest of the house and there is not much circulation of air in them.

Birds that are affected should be removed immediately to a cool place and their heads and legs doused with water. It will also be a good plan to bathe the heads with cool water frequently. Keep them in the cool place until they have fully recovered. A window in the rear of the house under the dropping board, which is kept open all the time, will help considerably, since it will allow of a circulation of air on the floor, providing, of course, the other openings are kept open.

Where small houses are used, it is the usual custom of poultry keepers to have wire tacked around the bottom of the house to keep the birds out from under the house. In extremely hot weather, it is a good plan to remove the wire and let the birds go under the house to escape the hot rays of the sun, particularly if there is very little shade or no shade at all in the yards. Frequent visits must be made to all pens to remove any birds that show signs of prostration.

Pests

AMONG the difficulties encountered by poultry keepers in growing the new pullets are those raised by pests. It is most discouraging to have a nice bunch of pullets about ready to lay killed by dogs, skunks or weasels, or stolen by thieves.

Strong wire, firmly nailed in place, will help greatly to keep out some of these pests. Wire cloth is even better than the regular poultry netting. It is a wise plan to close all doors, including small exit doors, at dusk after the pullets have all gone to roost. This means opening them the first thing in the morning so the birds can get the benefit of the early morning sun.

Where range houses or shelters are used that have the four sides made of wire, it is a good plan to have the floor made of wire cloth, about two meshes to the inch, so animals cannot get at the birds from this direction.

Some poultrymen who raise a number of pullets each year guard against theft by hiring a man to sleep in one of the range houses close by, armed with a shotgun, so he can be on hand if needed. They have found this good insurance.

Chickens Need Water

IT IS impossible to try to grow good pullets—or cockerels—without plenty of drinking water. As more than half the body is water, it is

quite necessary that water be supplied. This means keeping water pans, troughs or fountains filled with clean, fresh water.

An ingenious automatic device can be made from the valve of an automobile tire by using a small connecting pipe to join the faucet and the valve, inverting the valve and fastening to the faucet just above the valve two pieces of metal opposite each other that project out and down at an angle of about 45 degrees. A small spring is fastened to the end of each piece of metal and at the other end of each of these springs is fastened a bar that runs straight across under the tire valve and fits up flush against it when the empty pail is hung on it.

In this position, the water runs out through the valve and when the pail is full the bar is pulled down, allowing the small needle in the valve to fit into place and prevent the flow of water. As the pail becomes empty the bar raises and the water is permitted to run into the pail again.

Adult birds need water as much as growing birds do, and it is as important that their drinking vessels be kept filled as well.

Summer Care of Males

IT IS the practice of poultrymen to remove males from the flocks after the breeding season is over. This is to produce fertile eggs during the summer so there will be less danger of the eggs spoiling and to prevent the males from bothering the hens.

Males that are good enough to be held over for the next breeding season should receive some care, however, and not be made to shift for themselves so that they become injured or become lousy or in some other way have their vitality lowered so they are impaired for breeding purposes next year. Crowding males into a small building during hot weather will not do them any good.

Allow males as much room per bird as the hens are allowed, keeping them in a well fenced enclosure and having roosts in the yard. It will pay to examine the birds carefully at different times throughout the summer to see that they are in good condition.

Many breeders think that males are frequently spoiled for breeding purposes by being kept from the hens for any great length of time. They therefore allow the males to run with the hens for a few days at a time several times during the summer.

Too Early Laying Is Not Wanted

THE BIRDS that start to lay early are usually, other things being equal, the best birds in the flock. However, early laying at the expense of body growth and development is not wanted. The early hatched pullets, some of them, will be starting to lay now, but they must not be forced. If these pullets come into lay normally and are well developed, they may be permitted to lay as they will. If, on the other hand, they come into lay before having physically developed as they should, an effort should be made to hold them back somewhat until they have developed further.

Small eggs throughout the year, when eggs should be normal size, are the result of laying before body

growth has been made. An improperly matured bird—one that will not be able to stand up under a full season of continued egg production—is also the result. Such birds will not only "go to pieces" some time during the year, but are also susceptible to attacks of disease.

Poultrymen differ in their methods of holding back these early layers. Some withhold mash entirely for a period of two or three weeks, feeding heavily of grain; others add more

bran to the mash; and others feed a wet mash as a fattener. A good mash to feed is one composed of equal parts of corn meal and ground rolled oats moistened with milk, just barely enough to make the mash crumbly. This is fed once a day. The object is to put on weight and encourage further growth. Three weeks is long enough to attempt to hold back the pullets. Pullets that are in good weight when they start to lay should not be held back at all.

Central Wire Bracing in the Peach Orchard

By MONROE McCOWN

Purdue Agricultural Experiment Station

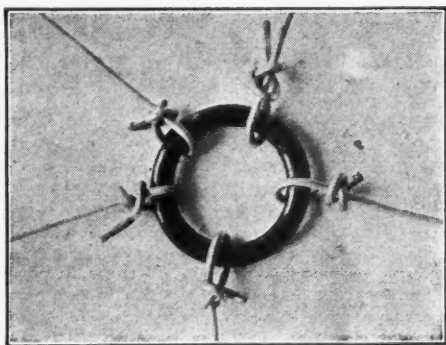
SOME TYPE of bracing is usually advisable in the peach orchard, even though the crop is well thinned. Wooden props have served this purpose for years, but they have many disadvantages. They interfere with cultivation, are rather expensive when one considers the average life of props, and in some sections native wood for props is becoming scarce. Another disadvantage is that they must be hauled into the orchard, put in place and then gathered and stored in a dry place each year. This requires time, and several trees are often broken before the grower decides that support is necessary. Because of these disadvantages, several Indiana growers have tried central wire bracing as a substitute. The opinions of these men as to the practicability of wire bracing should be of interest and considerable value to other peach growers.

Is Wire Bracing Satisfactory?

I. E. Cushing, of Vincennes, Ind., states: "I believe central wire bracing is a mighty good thing for large trees. We expect to do more of it this season."

J. W. Kimmel, Vincennes, has this to say: "I found central wire bracing very practical. I had very little limb breakage in my trees. I would advise using this system in orchards that are as old as eight or nine years, when a bumper crop is expected."

J. N. Dyer, Vincennes, gives the following opinion: "We did some wire bracing six or eight



The figure eight tie is neat, economical in use of wire and will withstand heavy strain. The wires are fastened to the limbs by means of staples or screw eyes.

years ago and are preparing to do considerable of this work in the near future."

Frank Street, Henderson, Ky., says: "We feel that central wire bracing is more efficient and no more expensive than wooden prop bracing. In fact, our planting of peach trees is so close that the use of wooden props would not be at all feasible."

W. B. Yates, Oaktown, states: "To do any good, the wires must be placed rather high on the limbs. When so placed, they are a constant annoyance in both picking and pruning. Limb breakage where the wire is attached is not infrequent. Central wire bracing of trees, I think, is most desirable to strengthen bad crotches but

has a rather limited use otherwise."

One can readily see from the above comments that there is a variance of opinion as to the value of central wire bracing. Wire bracing seems to have its disadvantages as well as its advantages. On the other hand, the advantages would seem to outweigh the objections.

Moisture is usually a limiting factor in the peach orchard, especially during the four weeks just preceding harvest. Frequent cultivations are needed to help conserve this much needed moisture. It is impossible to cultivate close to the trees if wooden props are used, as wire bracing will in no way interfere with this operation.

Comparative Cost

Frank Street: "Supplies for 1000 trees with an average of five limbs wired: rings, \$20; staples, \$6; and wire, \$9. We used No. 11 galvanized wire and two-inch galvanized rings. This size ring costs \$3 per gross. We feel that a smaller ring could be used with no decrease in efficiency."

J. W. Kimmel: "I would judge that it cost me 25 cents per tree for the wiring I did. I will have the benefit of it for several years to come. Sawed props cost five to eight cents each without the hooks. Native props are difficult to obtain."

W. B. Yates: "Hooks cost \$16.50 per thousand and the sawed strips two cents each at the mill. The sawed prop and hook are rather expensive at first but if properly

cared for should last a long time. At present our props are stacked and sheltered and the hooks dipped in oil to prevent rusting."

I. E. Cushing: "Our native pole props cost about five cents each and will last two to four years. Sawed props can be purchased for an average of about eight cents each. These props, properly cared for, will last 10 years."

Seemingly, the initial cost of both is about the same. Over a period of years, however, wire bracing would probably be the least expensive. The braces can be installed at any time and remain in place while the wooden props must be placed each year.

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BOOK DEPARTMENT

American Fruit Grower Magazine
53 W. Jackson Blvd.
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The Bushel Sack for Apples and Potatoes

By C. P. WAUGH

(In the April issue of AMERICAN FRUIT GROWER MAGAZINE an eastern grower described a heavy paper bushel sack he had originated for handling apples to the automobile trade. Many subscribers having written for more detailed information about the sack, and particularly about the funnel described by Mr. Waugh, with which the sack is filled from the bushel basket, we asked him to supply clearer information. The article which follows, and the pictures, are his response to this request.—EDITOR.)

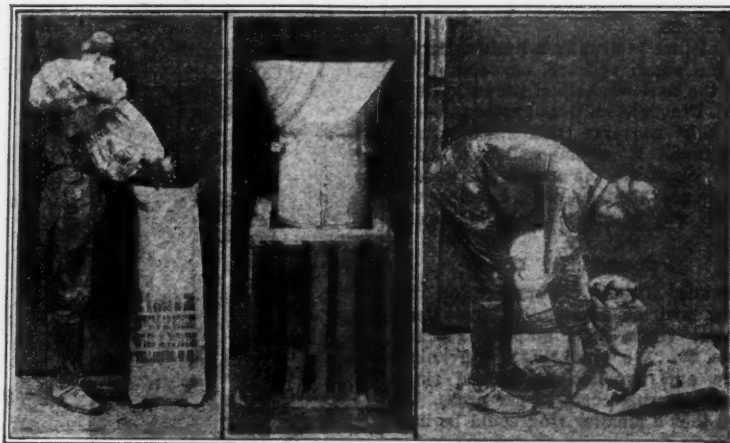
THE BUSHEL bag which I described in the April issue is now manufactured by our paper bag mill here at Wellsburg, W. Va., so no more information about it need be given other than appears in their announcement. The manner of filling the bag, and particularly the construction of the funnel, can best be gathered by studying the three pictures which appear with this article.

The funnel is shown in the center. The lower portion, which fits into the paper bag, is 10½ inches in diameter.

out part of the funnel. Then grasp the handles of the funnel, through the sack, and gently raise the sack, allowing the fruit to gently roll from the basket, through the funnel and into the sack. By the time you have raised the sack again to an upright position, your basket is empty and the sack is full, without having bruised any of the fruit. This is shown in the picture to the left.

When tied, this sack makes the neatest bushel package we have ever used. And for automobile trade it is ideal. People dislike to carry a bushel basket in a fine car, and it takes up a lot of room. But a car filled with seating capacity can always find room for one or two of these sacks. They make good shipping packages and carry well.

For the roadside stand, they are quickly filled from the display baskets.



Mr. Waugh's method of filling the sack without bruising the fruit.

This permits the handles of the funnel to go into the mouth of the sack. Any tinner can make one of these funnels by studying the picture. The cut-out portion of the upper part of the funnel should just about fit the outside of a bushel basket.

To fill the bag from the bushel basket, the bag is stood up and the funnel inserted so the handles are inside the sack. Then you "break over" the sack, lowering the funnel to the floor, as shown in the picture to the right. The bushel basket filled with fruit is carefully tilted into the cut-

People like to see what they are buying from a stand, but when they buy from the appearance of the fruit in an open basket, they really prefer to take the fruit home in a bag of this kind.

I do not make any charge to my customers for the bags, as I believe the advertising value of having our name on the package the customer takes home is worth more to us than the cost of the package. But to benefit by this form of advertising, the fruit must, of course, be the kind that will bring repeat orders.

Advantages of Road Stands

THE CHIEF advantages of roadside stands to the fruit grower, according to Dr. U. P. Hedrick of the New York Experiment Station, Geneva, are that they eliminate the middlemen and that all transactions are for cash. The roadside stand also offers an opportunity for the sale of a far greater variety of products than would otherwise be possible, such as fruit by-products and perishable goods that could not be shipped to distant markets.

Success with these stands, according to Dr. Hedrick, depends largely upon the attention given to details which make the stand attractive to the passerby and upon the courtesy and energy of the owner. Special containers adapted to the commodities and quantities sold at the roadside should be provided and should be

made as attractive as possible. Of course, they need not be as strong as containers used for shipping products to distant markets.

If he is to develop the possibilities of roadside marketing to the fullest extent, the fruit grower must plan to produce a much larger number of varieties than would be the case if he were marketing in commercial lots. These varieties should provide a succession of the different fruits ripening over the entire season and providing high quality and attractiveness in sorts suitable for eating out of hand and for culinary purposes.

A well-conducted roadside stand should be a source of steady income to the fruit grower with a minimum of overhead expense and without the inconvenience incident to dealing with a commission house.

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Orchard Tour Planned

THE ANNUAL orchard tour of the Michigan State Horticultural Society will be held on August 3 and 4. It is planned to visit the St. Catharines district of Ontario, Canada. The starting point will be from Windsor on the morning of August 3, and the territory between Windsor and Hamilton will be toured. The second day will be spent in the concentrated St. Catharines district, the tour ending Saturday evening, August 4, at Niagara Falls.

Detailed information may be obtained from Secretary H. D. Hootman, East Lansing, Mich.

Ten Thousand Barrels of Apples

(Continued from Page 4)

Vergennes is about 300 miles from New York City. It can readily be seen, therefore, that apples like Pewaukee, which sell for only \$3 to \$4 a barrel, do not afford a suitable margin when the cost of growing and marketing is considered. The cost of selling, generally denoted as commission, is 75 cents a barrel, but in this case Mr. Loomis sold his own fruit, so could pocket the commission. If shredded oil paper is used, as is common in Vermont, there is an extra charge of 20 cents. Mr. Loomis estimates the cost of growing apples up to marketing time at \$1 a barrel—a very moderate figure.

The barrels for the 1927 crop were made at the orchard in a standard cooper shop where two men were kept busy nearly all summer making barrels at nine cents apiece. A stand-

space do not permit a full story here, but the average prices for the No. 1 grade of the various varieties for the last four years, not including 1927, are given in Table 2.

The figures speak for themselves. But a careful reader will study the relative yields and the relative prices over the four-year period. Four dollars for Pewaukee is one thing, but \$10 for McIntosh is another and better thing!

It seems proper to also state in this article that Mr. Loomis has topworked many of his inferior varieties. Probably three-quarters of all the apple trees planted in Vermont in the last 12 years have been of the McIntosh variety, which tops the New York market with the highest price per barrel. The highest quality yields the largest net price to the grower, be-

Table I.—Loomis Farm Apple Crop Yield
Barrels of apples from 100 acres of 16-year-old trees.

	1921		1922		1923		1924		1925		1926		Total 6 years	
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Alexander	225	23	125	23	114	12	204	66	323	88	335	56	1359	268
Wealthy	17	3	101	11	14	6	148	21	120	11	234	86	634	118
R. I. Greening	201	14	209	81	182	40	468	145	819	310	1186	128	3065	618
N. W. Greening	26	6	13	4	21	7	46	7	53	28	69	14	6342	1599
McIntosh	104	6	712	562	373	135	1092	620	3222	175	1831	101	417	239
Banana	12	2	97	24	9	5	92	29	81	67	172	30	1184	384
Tolman	54	12	314	65	442	104	340	280	402	..	616	239
Spies	7	2	73	9	51	21	420	119	68	9	150	13
Kings	5	..	7	..	3	1	11	2	35	6	87	4	148	13
Odd varieties	27	2	51	10	15	2	61	13	152	14	75	18	381	59
	678	70	1736	789	731	208	2615	1028	5565	1098	4459	446		
Total, Nos. 1 & 2	748		2524		939		3643		6663		4905			
Crop of 1927 McIntosh											5,000 barrels			
Crop of odd varieties											5,000 barrels			
Total											10,000 barrels			

Table II.—Prices Received for No. 1 Grade Fruit in Last Four Years

Alexander	\$4.00-5.00	Spitzenberg	\$7.00-8.00
Greenings	6.00-8.00	King	5.00-7.00
McIntosh	8.00-10.00	Fall Pippin	6.00-7.00
Wealthy	6.00-7.50	Grimes	5.00-6.00
Winter Banana	6.00-7.00	Tolman	5.00-7.00
N. W. Greening	6.00-7.00	Baldwin	4.00-5.00
Pewaukee	3.00-4.00	Westfield	4.00-5.00
Northern Spy	7.00-8.00	Hubbardston	4.00-6.00

ard day's work for a skilled cooper is 90 barrels, which affords a day wage of \$8.10. Some two-bushel barrels were used for some varieties, and they seemed to meet a need for certain grades, but the bulk of the crop was packed in standard three-bushel barrels. Most of the growers in Vermont do not make their own barrels, although it might be profitable to do so.

Relative Selling Prices

Another interesting aspect of commercial orcharding in Vermont is the price received. The exigencies of

cause it costs no more to grow good fruit, and a larger margin is left between the cost of production and the selling price.

Furthermore, the commercial growers in Vermont are concentrating on a "big-four" variety list, namely McIntosh, Spy, Fameuse, and either Delicious or Northwestern Greening. Small lots of newer sorts are, of course, being planted for trial, such as Cortland, Starking, Golden Delicious, and a few others. But four standard sorts are enough, and these allow ample spread of effort at picking time.

Good Red Raspberries

THE DEVELOPMENT of new varieties and a better knowledge of how to meet the inroads of mosaic are the chief factors contributing to a revival of interest in raspberry culture.

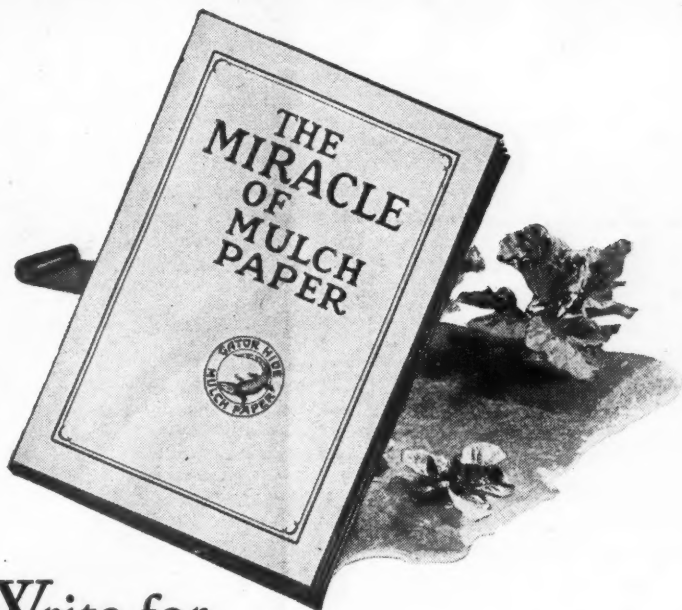
June and Latham can be recommended for general culture because of the bright, attractive berries that are produced in large quantities and find such ready sale on city markets. Their fruit is firm enough for shipping and when canned equals that of the popular Cuthbert in appearance and quality. June begins to ripen its fruit at the close of the strawberry season and has an unusually long season. Latham comes in two weeks later. Latham, too, is remarkably resistant to mosaic.

For the home garden, roadside stand, or nearby market, Herbert will prove very satisfactory. The berries are large and of good quality, but

they are too soft to ship well. Herbert is hardier, more productive and possesses greater resistance to mosaic than Cuthbert, and deserves a more extended trial.

Where quality is the first consideration and where mosaic is not a serious factor, Cuthbert is still a prime favorite with its conic berries possessing delicious flavor. It is a favorite sort with the canning factories and preservers, and is much grown for these purposes.

The autumn-fruiting or so-called everbearing raspberries can be recommended only as a novelty for the home garden. The autumn crop is usually light, the quality is not high, and the berries are often poorly developed. La France, or the closely related Erskine Park, and Ranere, or St. Regis as it is sometimes called, may be tried. Both sorts are hardy and extremely resistant to mosaic.



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Write advertisement on separate sheet. Please
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All advertising copy, discontinuance orders
or change of copy must reach this office by
the 10th of this month for next issue.

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AMERICAN FRUIT GROWER MAGAZINE
53 West Jackson Boulevard, CHICAGO

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Salesmen calling on hardware trade and farm and
orchard supply dealers will find our fruit pickers' bag
a big money making side line. No trouble
to carry and show, and a good seller. Liberal
commission. Write for particulars. Barker Mfg.
Co., 276 South Clinton Avenue, Rochester, N. Y.
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Without experience, training or capital, I'll
show you how you can become financially inde-
pendent. Easy, pleasant work. \$100 profit every
week. Free automobile. Write today for par-
ticulars. Albert Mills, Mgr., 1730 Monmouth,
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WOULD YOU BUY 240 ACRE FARM, 40 ACRES
apples, prime condition, balance ideal fruit land,
modern home, tenant house, average income five-
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purchaser high income on investment. Address
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Texas winter garden 3 weeks earlier than same
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ORCHARD—3000 APPLE TREES, 18 TO 23
years old, 300 peach trees, 65 black walnut trees,
30 acres of timber, 160 acres in all. 6-room house
with modern conveniences. On the outskirts of
the town of Bedford, which is on the Lincoln
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sota, North Dakota, Montana, Idaho, Washing-
ton and Oregon. Make a trip and see the growing
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or sell? Need help? Want a position? For
results advertise in the American Fruit Grower
Magazine classified columns. Over 250,000 sub-
scribers. Rate 15c per word, cash in advance.

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NEW PEASE PERFECT GRADER. BARGAIN.
H. Van Antwerp, Farmers, Ky.

HELP AND INSTRUCTION

U. S. GOVERNMENT JOBS. \$1140-\$3300 YEAR.
Men-women, 18-50. Steady work. Vacation.
Experience usually unnecessary. Full particulars
with sample coaching free. Write immediately—
today. Franklin Institute, Dept. F-75, Rochester,
N. Y.

EARN \$25 WEEKLY SPARE TIME, WRITING
for newspapers and magazines. Exp. unneces-
sary. Copyright book, "How to Write for Pay,"
free. Press Reporting Inst., 979, St. Louis, Mo.

HELP WANTED

MEN—BIG PAY, SOUTH AMERICAN WORK.
Companies pay fare, expenses. South American
Service Bureau, 14,600 Alma, Detroit, Mich.

HELP AND INSTRUCTION—FEMALE

WANTED—GIRLS-WOMEN, 17 UP. LEARN
gown making at home. \$35.00 week. Learn
while earning. Sample lessons free. Write im-
mediately. Franklin Institute, Dept. F-545,
Rochester, N. Y.

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MOTORCYCLE BARGAINS—USED, REBUILT.
Guaranteed. Shipped on approval. Terms. Cata-
log free. Clymer, Denver, Colo.

PERSONAL

EPILEPSY CURABLE? DETROIT LADY FINDS
complete relief for husband. Specialists home
and abroad failed. Nothing to sell. All letters
answered. Mrs. Geo. Dempster, Apt. 1, 6000
La Fayette Blvd., West, Detroit, Mich.

RHEUMATISM—I WILL GLADLY TELL ANY-
one how I was cured in four days after two
years' terrible suffering. It makes no difference
what form you have, if you are suffering. Write
Dept. Z, Box 147, Little Rock, Ark.

EPILEPTICS—WILL TELL YOU HOW I WAS
cured from dreadful malady. Nothing to sell.
Write Flo Volpert, Dept. B-1, Box 117, Little
Rock, Ark.

TOBACCO

TOBACCO, AGED; SMOKING, 10 POUNDS, \$1.35;
chewing, \$1.75; cigars, 50, \$1.65; twist, 24,
\$2.40. Kentucky Farmers, Pryorburg, Kentucky.

Helping Pop

The minister raised his eyes from
the notes of his sermon just in time
to see his young son in the gallery
pelt the congregation with horse
chestnuts. The good man was prepar-
ing a frown of disapproval when the
young hopeful cried out: "You 'tend
to your preaching, Pop; I'll keep 'em
awake."

Sad Case

Old Lady—Why, you poor fellow!
How long have you been out of work?
Bum—I was born in 1891.

The July Patterns

No. 3000—Simplicity and Smartness.

Designed in sizes 16 and 18 years, 36,
38, 40, 42 and 44 inches bust measure.
Size 36 requires 2 1/2 yards of 36-inch
material with 1/4 yard of 32-inch con-
trasting.

material with 1/4 yard of 36-inch con-
trasting.

No. 977—A Temptation!

Designed in sizes 16, 18 and 20 years,
36, 38, 40, 42 and 44 inches bust meas-



No. 2804—Afternoon Dress.

Designed in sizes 16 and 18 years,
36, 38, 40 and 42 inches bust measure.
Size 36 requires 2 1/2 yards of 32 or 36-
inch material with 1 yard of 40-inch
contrasting.

No. 2806—Typically Summer Sports.

Designed in sizes 16 and 18 years,
36, 38, 40, 42 and 44 inches bust measure.
Size 36 requires 3 yards of 40-
inch material with 1/4 yard of 27-inch
contrasting.

No. 3319—Skirt Fullness Placed Low.

Designed in sizes 16 and 18 years, 36,
38, 40 and 42 inches bust measure.
Size 36 requires 3 1/2 yards of 40-inch
material with 5 yards of binding.

No. 750—Morning or Sports Dress.

Designed in sizes 16 years, 36, 38, 40,
42, 44 and 46 inches bust measure.
Size 36 requires 2 1/2 yards of 40-inch

ure. Size 36 requires 3 1/2 yards of 40-
inch material with 1/4 yard of 27-inch
contrasting.

No. 846—Dainty Bolero.

Designed in sizes 6, 8, 10 and 12
years. Size 8 requires 1 1/4 yards of 36-
inch material with 1/4 yard of 18-inch
contrasting and 3/4 yards of ribbon.

No. 795—For Wee Folks.

Designed in sizes 2, 4 and 6 years.
Size 4 requires 2 1/2 yards of 40-inch
material for bloomers and dress.

No. 729—Embroidery.

Border for outline or solid embroid-
ery. Pattern includes 5 yards of bor-
der, 3 1/4 inches wide. This border is
made up of narrow bands which can
be used separately. The band of tri-
angles at the top is 1 1/4 inches wide,
the band of oblongs below is 1 1/2
inches wide. Suitable for curtains,
scarves, portiers, luncheon cloths,
towels, etc (blue and yellow).

Patterns may be secured by mail, at 10 cents each, postpaid, from AMERICAN
FRUIT GROWER MAGAZINE PATTERN SERVICE, 23 East 18th St., New York.

Harvesting and
Marketing the
Cherry Crop

(Continued from page 6)

from our region pooled and shipped
by refrigerator car. Many difficulties
were encountered. In the first place,
only a few cities can absorb a carload
of sweet cherries without a drop in
price. If possible, it is better not to
have them under ice. Then, too, our
method brought in more expense in
selling. The boat to Chicago arrives
several hours after the early morning
market, with a consequent holding
over of the fruit an additional day.

With the completion of a concrete
road two years ago, we bought two
heavy duty Reo speed wagons, and
for two years they have seemed to
have solved our transportation prob-
lems. During the shipping season, a
truck leaves the packing shed each
noon, arriving in Chicago, 327 miles
away, with about four tons of fruit,
the following morning about three or
four o'clock. The venture has paid
its way, independently of fruit results.
But these are most emphatically
successful.

A marketing agreement was made
with the American Fruit Growers,
Inc. Their representative was in our
packing shed a good share of the first
season until he became convinced our
product was a credit to the Blue
Goose label. Our truck drivers saw
the fruit at both ends, and not one
package in the two years was unac-
counted for. Trucking in this manner
kept us in direct touch with the mar-
ket at all times. Improvement in our
pack came about when we saw the
need for it at the other end.

It might be interesting to describe
our method of loading the truck. The
lugs are placed lengthwise in six rows
across the truck, separated by about
a two-inch air space. These rows are
held tightly in place by laths. The
motion of the truck furnishes ideal
ventilation, the boxes do not budge
and the fruit on arriving in Chicago
looks exactly as it did when loaded at
the packing shed.

One of the problems we have had to
face in this method of transportation
is to furnish each day just so much
packed fruit, regardless of weather or
condition of ripening. This, however,
has been more easily worked out than
was at first thought possible. By this
method a uniform flow of fruit is fur-
nished, which is so desirable from the
salesman's point of view at the other
end.

Our farm is in the center of Michi-
gan's summer playground, filled with
visitors all eager to "Say it with cher-
ries" to the "folks back home." Their
interest in our cherry farm during the
harvest season is remarkable. Here
is where we discovered that the size
of the fruit was so especially desir-
able. Each visitor insisted on "The
big black ones." The mail order busi-
ness has rapidly increased for several
years past without advertising, other
than a word to the people who ordered
the past season. Deliveries have been
satisfactory almost without exception.
One firm in Alabama last year ordered
over 200 boxes sent to their patrons in
all parts of the South. They went
through in excellent condition.

However, while the direct mailing
has been very instructive and profit-
able, it probably will never consume
an essential part of the crop.

Squire Green—Mandy, after I die, I
wish you would marry Deacon Brown.
Mandy—Why so, Hiram?
Squire—Well, the deacon trimmed
me on a hoss trade once.

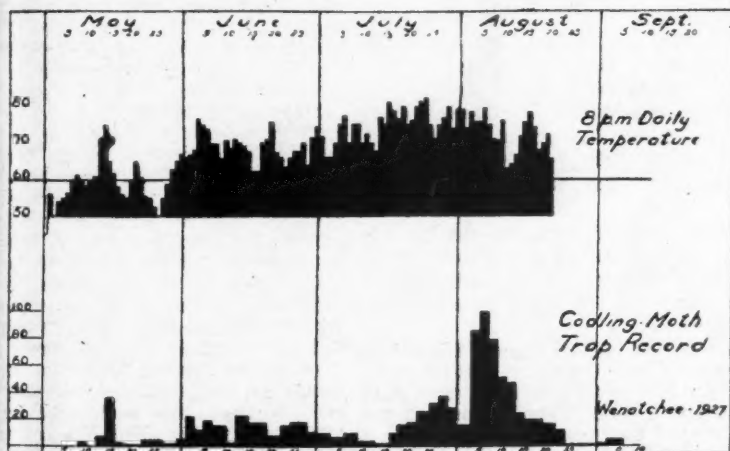
New Methods Promise Success in Codling Moth Control

(Continued from Page 7)

extent among the orchardists of the Northwest last year and will be further extended this year. The traps are used in connection with the thermometer which Mr. Newcomer, federal entomologist at Yakima, has proved may be used as a gauge for estimating egg-laying temperatures. He found that when the temperature is approximately 60 degrees at 8 P. M. eggs are being laid after moths have emerged. The first cover spray should ordinarily be on within 10 days after the first eggs are laid, although a long spell of cold weather in the spring may slightly delay the hatching of these eggs and give a little more time for the first cover. Successive covers will be governed by the comparative abundance of the moths and in our warmest districts calls for a cover spray every 10 days until the moths of the first brood have practically quit emerging. A good many of our orchardists discontinued the use of the moth traps after the date for the first cover was established, but it is important to continue to watch the traps in order to know just what the codling moth conditions are. In the Wenatchee district last year, there

the tree where there may often be a delay in moth emergence.

Mr. Spuler recommended the use of apple cider or apple juice as a bait for attracting codling moth. Mr. Yothers, federal entomologist at Yakima, had previously worked out the use of refined molasses. Last year, experiments in the Wenatchee district indicated that malt sirup was even more effective. A comparison of malt sirup and apple juice for 56 days showed 306 moths per trap caught with the malt sirup and 176 moths per trap with the apple juice. A comparison by Mr. Spuler of the apple juice and molasses over a 95-day period showed 151 moths per trap for the apple juice and 128 moths per trap for the molasses. The cost of the mixture does not vary a great deal, but the orchardist who has a supply of apple cider should use it rather than buy other products. The malt sirup is made up of one gallon sirup and one yeast cake, and is diluted with 19 gallons of water. Refined molasses is made up of one gallon of molasses, one cake of yeast and 19 gallons of water. Fermented apple juice is made up of one gallon of cider, one pound of



The codling moth traps should be watched to determine just what the codling moth conditions are. The chart shows the relationship of the codling moth emergence, the temperature and the time of applying sprays.

was a very definite break between the time of emergence of the moths of the first and second broods. Apparently the last moths of the first brood came out about July 6 to 8, with the peak of egg laying around the first week in June. The accompanying chart indicates the relationship of the codling moth emergence, the temperature and the time of applying sprays. Mr. Spuler's first cover spray was applied about May 25, the second cover June 9, the third cover June 22. These applications took care of the first brood worms and were the approximate dates of spraying in the Wenatchee district. The necessity for the application of a second brood spray is indicated by the number of moths caught in the trap during the last two weeks of July.

A few years ago we were using screen or muslin traps at the base of the tree to determine the emergence of the moths, but these are much less efficient than the moth traps which we are now using and which are filled with fermented juice to attract the moths. The bait trap catches the first moths which fly, while the old form used at the tree base showed only the emergence of moths at the base of

brown sugar, one yeast cake and four gallons of water.

The Containers

Mr. Spuler discovered in his first experiments in 1926 that he caught 12½ times as many moths in traps placed near the top as compared with those six to eight feet above the ground. Mr. Spuler also found that he caught four times as many moths in the wide mouthed mush bowl type of trap as in the ordinary narrow-mouthed fruit jars. He advocates an enameled or granite pan or can treated with some kind of covering to avoid rust. These traps should be at least six to eight inches in diameter and should hang well up in the tree.

Two methods are being used in the Wenatchee district for suspending the traps in the tree so that they can be reached from the ground without climbing the tree. Mr. Spuler used a long pole with a hook in the end to detach the trap which was suspended by a bail and a screw hook. A new device worked out by Yakima orchardists was exhibited at the state horticultural meeting at Yakima last winter. It was a long prop with a cross arm and a screw eye in the cross arm



Saying "Goodbye" to Yesterday—

Yesterday's slow, clumsy methods of transporting perishable products have gone definitely into the discard with the advent of the new Speed Wagons. For Speed Wagons make old trucks obsolete and many new ones dear at any price.

Today, Speed Wagons protect your loads of fruit or vegetables with long, resilient springs, pneumatic tires, vibrationless 6-cylinder power and 4-wheel internal expanding two-shoe hydraulic brakes.

They lessen the time that your goods must be in transit, because the specially designed Speed Wagon engine gives you quicker acceleration and increased ability to hold a faster pace for hour after hour.

They are more dependable, because they have magazine oiling systems for chassis, automatic in action, to add even longer life to Speed Wagon sturdiness.

Try out a new Speed Wagon—there are thirteen sizes to choose from, at new low prices. Drive a Speed Wagon—start it, step on it, stop it, park it. Then you'll understand.

NEW wheelbases—thirteen of them, ranging from 115 to 175 inches—capacities from ½ to 3 tons—a standard model to fit your special job!

NEW 4-wheel brakes—hydraulic, not mechanical—two-shoe internal expanding, not external contracting. Always in adjustment, protected against dirt and moisture, working equally well in reverse as in going forward.

NEW chassis lubrication—magazine system, using cylinder oil and automatic in action. Operates longer on one oiling than any other method.

NEW low prices—price reductions ranging up to \$260 put Reo Speed Wagon values, like Speed Wagon engineering, even further in advance of anything else on the market today.

REO MOTOR CAR COMPANY, Lansing, Michigan

JUNIOR—Capacity ½ ton. Chassis \$895. **STANDARD**—Capacity 1½ tons. 133-inch wheelbase, Chassis \$1245; 148-inch wheelbase, Chassis \$1345. **HEAVY DUTY**—Capacity 3 tons. 159-in. wheelbase, Chassis \$1985; 130-in. wheelbase (Dump) \$1935. **TONNER**—Capacity 1 ton. 123-inch wheelbase, Chassis \$995; 138-inch wheelbase, Chassis \$1075. **MASTER**—Capacity 2 tons. 148-inch wheelbase, Chassis \$1545; 164-inch wheelbase, Chassis \$1645. **SENIOR**—Capacity 3 tons. 175-in. wheelbase, Chassis \$2090. **GENERAL UTILITY**—Capacity 1½ tons. 143-in. wheelbase, Chassis \$1345. Chassis prices at Lansing

SPEED WAGON

Powered with 6-cylinder motors

and in the upright. A heavy string attached to the moth trap and run through the screw eye on the cross arm and upright makes it possible to raise and lower this trap from the ground.

The Efficiency of the Traps in Control

One year ago, after a year of successful experiment with the cider traps, we were recommending the traps only for setting spray dates. At the present time, however, we are feeling very optimistic in regard to their use in controlling the moth and materially cutting down on the number of sprays. An experiment by Mr. Spuler last year in an orchard sprayed by the owner, where seven cover sprays were put on, shows the following results in two separate blocks where the three varieties were compared as to the results in controlling worms with the cider traps:

Comparison of Results Secured from Baited and Not Baited Trees Which Received Seven Cover Sprays.

	Per cent injured	Per cent wormy
Jonathan—		
Baited	16.0	2.55
Not baited	21.2	4.0
Arkansas Black—		
Baited	12.9	0.6
Not baited	27.7	2.2
Rome—		
Baited	14.8	2.3
Not baited	22.7	4.1

This indicates that almost twice as good control was secured in the Jonathan and Rome plots and almost three times as good control was secured in the Arkansas Black plot by the use of moth traps. These trials were made on comparatively small plots, and it is quite evident that when applied to larger tracts the results should be even more promising.

Naturally the question will arise in the orchardist's mind as to whether he is catching only the codling moths

Index to Advertisements

The concerns whose advertisements appear listed below are equipped to give prompt and satisfactory service to the American fruit grower. Most of them issue literature that is freely at the disposal of our subscribers. It is to the advantage of all that when writing to an advertiser you use the address exactly as it appears in the advertisement, and that you state in your letter: "I Read Your Advertisement in AMERICAN FRUIT GROWER MAGAZINE."

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Do a Favor to Your Neighbor

There is a neighbor living near you, a fruit grower. You know he is trying to do his best, for he frequently asks you what to do and when to do it, and you are always glad to give him the information.

If you think he would be benefited by the expert advice he would receive every month through the AMERICAN FRUIT GROWER MAGAZINE, why not call it to his attention? He would thank you for the courtesy.

When you are through reading this issue, loan this copy to that neighbor, first placing a big black "X" in the margin opposite this coupon. He'll get the point and grasp this opportunity to better his methods. Better reach for your pencil and do it now.

Your Neighbor, in all likelihood, will avail himself of the opportunity to use this coupon

AMERICAN FRUIT GROWER MAGAZINE

53 West Jackson Boulevard, Chicago, Illinois

Gentlemen: I enclose a dollar. Send me AMERICAN FRUIT GROWER MAGAZINE three years.

Name

Address

which emerge from one particular tree or whether he is getting some of those from surrounding trees. Mr. Spuler made counts including wormy apples and stings and his results indicate that the moths do come from surrounding trees. On one tree he caught 176 moths in one trap and there was a possibility of only 39 coming from this tree, counting the worms in the bands and in the tree scrapings, as well as all wormy apples and wormy thinnings. Indications seem to point to the fact that one moth trap to every four or five trees will materially aid in the control of the codling moth.

That moths are attracted to certain trees under normal conditions is very evident from actual orchard experiences. A survey of the valley three years ago indicated that there was a very definite relationship between the varieties and worminess in the same orchard. For instance, the Spitzenberg was found to be one of our most wormy varieties, while the Winesap

was found to be the least wormy. Orchards were found where the Spitzenberg was 20 per cent wormy, while the Winesap was only two per cent wormy. Other varieties seem to grade between these two extremes in various degrees of attractiveness for the codling moth. The orchardist will undoubtedly select his wormiest variety in which to place his moth traps.

As a result of the widespread use of banding, tree scraping and codling moth "hootch" traps, the outlook for the control of this insect pest in the Northwest is now more optimistic than it has been for many years. We feel that the application of the principles which have been established by the entomologists, together with increased spraying efficiency and the use of some substitute sprays, will soon do away with our spray residue problem. We do not expect to find any easy method and are not looking for any miracles to happen, but improvement in supplemental methods points the way to more efficient control.

Removing the Spray Residue

(Continued from Page 4)

spray, the fruit is carried forward by the rod conveyor between similar sprays of fresh water, which free it completely of its coating of acid. Rinsing is followed with a strong blast of air directed onto the moving fruit, which dries the fruit sufficiently for immediate packing. This type of machine may be provided also with a flume some 50 feet or more in length. This flume is provided for the purpose of receiving the fruit and floating it onto the conveyor on the washing machine. Water alone may be used in it, but frequently the flume is made to carry a dilute solution of the cleansing acid, which is kept in motion by a pump of suitable construction.

Another type of washer is made to deliver the cleansing solution with considerable force in spray form onto the fruit as it is floated through the body of the spray solution, held in a rectangular tank of approximately 500 gallons capacity. The contact of fruit with the spray and solution in the tank varies somewhat in proportion to the rate maintained in feeding the fruit into the tank and the angle at which the spray nozzles over the tank are set. The force of the spray, together with the pump, imparts a circulating motion to the washing solution and lodges the fruit against a conveyor, which lifts it clear of the solution and spray to a similar spray of cleansing water. The time of contact of fruit with the cleansing solution may vary from three to five or six minutes. Rinsing here is also followed by blasts of air that remove practically all adhering water.

In the third type of washing machine, the cleansing action is accompanied by submersion of the fruit in the cleansing solution. The submerger consists of sets of blades made to revolve by a chain drive in a vertically placed supporting frame, through about four and one-half or five feet of the cleansing solution held in a rectangular tank of some 2000 gallons capacity. This machine may contain as many as six submergers. For the first season's run, all but two were removed. At one end of the tank one of them was made to receive the fruit as the conveyor belt delivered it from the dumping table. It carries the fruit down the full depth of the solu-

tion and releases it again at the surface on the opposite side, to be floated some eight or 10 feet across to the second submerger, which repeats the submergence and releases the fruit onto a conveyor that carries it under a spray of rinsing water. The submerger tank in this machine carries through the pear washing season a solution of common salt (75 pounds to 100 gallons of water), and this salt solution is acidified with hydrochloric acid in concentrations much lower than were used in any other type of machine. The salt is used primarily, of course, to secure a sufficiently dense solution for floating pears. A combination of salt solution with acid, however, seems to have made for this particular type of machine a very effective cleansing agent. From the nature of the machine, submergence of fruit and its flotation across the tank should not vary in time to any appreciable extent. The contact of fruit with the cleansing solution is approximately four minutes.

Relative Efficiency of the Machines

The novelty of these machines in the fruit packing industry naturally occasioned among growers and shippers more or less discussion of their relative merits. Although some experimental work was devised for testing out the relative merits of these types of machines, it is doubtful if they were established with any high degree of certainty. It is sufficient to state that each one has merits of its own and each gave very satisfactory service during its initial season. Untinted praise is due the manufacturers of these machines for their contribution to the solution of an extremely difficult situation.

(Note.—The cleansing solution used, as well as the experiences of other districts in the Northwest in removing spray residue, is covered in the concluding installment of this article, which will appear in the August issue.)

"What has four legs, no wings, but can jump as high as the Woolworth Building?"
"I give up."
"A dead horse."
"But a dead horse can't jump."
"Neither can the Woolworth Building."

Birds in The Orchard

(Continued from Page 6)

Included among the bugs are the plant lice and their eggs, which are eaten during the winter. The beetles nearly all belong to the group of snout beetles, more commonly known as weevils. These insects are mostly of small size, and nearly all are known to the fruit grower as pests. Seventeen of them were found in the stomach of one bird. The plum curculio and the cotton-boll weevil may be taken as fair examples. Grasshoppers, because of their large size, are not eaten to an appreciable extent. Most grasshoppers are found on the ground also, and the chickadee confines his search for insects to the bushes and lower trees.

Small wasps and ants are eaten to some extent. Spiders are relished by them and are eaten at all times of the year, the birds locating them when they are hibernating in winter, as well as when they are active in summer. The vegetable food of the chickadee consists largely of small seeds, and in summer, the pulp of wild fruit. The wax from the seeds of the poison ivy is eaten during the winter months, but the seeds are not consumed. In this way the chickadee differs from most other birds, which swallow the seeds whole. The chickadee, after digesting the wax, passes the seeds through the alimentary canal, and so scatters them broadcast to reproduce the noxious plants.

In the southern part of the country, the Carolina chickadee and the tufted titmouse replace the black-cap and perform a similar service in those states. The bush titmouse is active in the western states. They are usually found in flocks flitting from tree to tree, busily hunting for insects and their eggs. The contents of 66 stomachs of these birds were found to consist mostly of injurious insects to the extent of 83 per cent. Of these the most important was a small hemipterous insect which amounted to more than half of the stomach contents. These insects frequently infest grapevines and other plants to a harmful extent. Several stomachs were almost exclusively filled with these minute creatures, some containing as many as 100 individuals.

The black olive scale was found in 24 stomachs and amounted to a little more than 18 per cent of the food. The stomachs also contained many other scales which could not be positively identified. A number of small snout beetles were eaten, some small caterpillars, and the remains of a spider.

Among the stomachs of the bush titmouse examined were those of one brood of eight nestlings about 10 days old. The vegetable matter in these stomachs was only three-fourths of one per cent and consisted of one seed and some rubbish. The animal matter was made up of beetles, wasps, bugs, caterpillars and pupae, and spiders. Every one of these stomachs contained pupae of the codling moth. The brood thus studied was one of about a dozen nests along the border of an orchard, and these birds were a great factor in holding the codling moth and other insects in check there.

The white-breasted nuthatch is widely known as a bird of the forest, but he often visits the orchards and groves, especially during the winter season. He is often found in company with chickadees, the smaller woodpeckers, and other tree trunk gleaners. The nuthatch searches over the trunks and larger limbs of trees,

particularly on the rough bark, where he finds a great part of his insect food. In one instance where the outer bark had been pared from a tree, two nuthatches were noticed busily engaged for two days in searching through the pile of bark chips on the ground.

The nuthatch is a funny fellow and goes down the tree trunks and larger limbs of trees head first in its quest for insects hidden under the bark. His nasal "yank yank," and repeated "ya yas" sound a bit like human laughter.

No other bird is so often seen upside down as is the nuthatch, but his climbing ability is unlimited. He circles round the branches, or moves up, down, and around the trunks, apparently oblivious to the law of gravitation. His readiness in descending topsy-turvy is due in part to the fact that, as the quills of his tail are not stiff enough to afford support, he is obliged to depend upon his legs and feet. As he has on each foot three toes in front and only one behind, he reverses the position of one foot in going head downward, throwing it out sideways and backward, so that the three long claws on the three front toes grip the bark and keep the bird from falling forward.

Thirty-four stomachs of nuthatches secured in Michigan contained many seeds, among them ragweed and wild sunflowers. The birds had eaten seeds in winter to the amount of 67.4 per cent of the stomach contents, while the remainder consisted of gravel and insects; but in early spring only 13.5 per cent of the food was of a vegetable nature, while 79.5 per cent consisted of insects.

Prof. King of Wisconsin found beetles, including snap beetles and boring beetles, in the stomachs of 14 birds of the species. In Massachusetts, the nuthatch feeds largely on beetles, taking many that bore in the bark or wood. He also feeds on the eggs of insects and on hibernating larvae and ants. Scale insects are taken in winter. The oyster-shell bark scale louse, injurious to the apple, pear, currant, and other plants and trees of the orchard, is eaten greedily. The proportion of insect food increases as spring advances, and the young are fed largely, if not entirely, on insects. One fall day the contents of the stomach of one of these birds was examined and it was found to contain 1629 eggs of the fall cankerworm moth. As there were no moth remains, it was evident that the bird had gathered these eggs from the bark.

In Massachusetts, a pair of these birds were watched flying from tree to tree, searching beneath the burlap bands for gipsy caterpillars. They carried and fed these to the full-fledged young.

These are but a few of the birds that by their presence alone add to the beauty and attractiveness of any orchard scene. They pay their way. It is well to bear in mind that the cost of our extensive spray programs has been increased by the disappearance of our native birds.

When fruit growers come to realize the tremendous value of such birds as have here been discussed, they in turn will take some simple measures to encourage the increase of these feathered helpers.

Under ordinary circumstances, all birds of these types are able to find food the year around. It is only during and after sleety weather, when

The Cottage was Ready for Them

An Advertisement of the American Telephone and Telegraph Company

A FARMER of Boone, Iowa, wished to drive to McGregor, Iowa, with his family for Labor Day. Cottages were available there but the time was too short to write and get an answer before they started. He telephoned to the state capital and got the name of the man in McGregor who had the cottages for rent. Later the same day he got this man on the long distance telephone, and the next afternoon the farmer and his family started on their 200-mile trip. The cottage was ready for them when they arrived.

The telephone makes life more enjoyable. It runs errands to neighboring towns. Calls the implement repair man. Gets the doctor. Summons aid in case of fire or accident.

Often the telephone pays for itself many times over by finding out when and where to sell for the best price. A farmer living near Marion, Indiana, started to sell 75 hogs but decided first to telephone and see if the price was the same. Prices had dropped a 1/2 cent so he waited until next day and received 3/4 of a cent more.

The modern farm home has a telephone.



trunks and branches of trees are coated with ice, that it becomes difficult for birds to find an abundance of food. At this time a handful or two of small grains, scattered here and there, will afford these birds sufficient food to carry them through until the ice coating disappears and permits them to again have access to insects and insect eggs.

Seedling Fruit Stocks

SEVERAL hundred thousand seedling stocks for fruits are already growing on the grounds of the New York Agricultural Experiment Station at Geneva as part of the nursery investigations begun in the spring. Now that the federal quarantine is going into effect in 1930 to prohibit the importation of nursery stock, the nursery industry in America is interested in a domestic supply, and because of the emergency nature of the situation, this phase of the work is the first to receive full attention.

The stocks being grown include seedlings from seed of many classes and from many sources. It is already evident that seed from some varieties of cherries, for example, will make good growth in one year while other varieties fail badly. Seeds from some Mazzard cherries germinate well, while seeds from others germinate

poorly. Rome Beauty and Ben Davis apple seed give uniform, vigorous seedlings. Baldwin seed is variable and seedlings lack vigor. All of this will be of immediate value to collectors of seed in this country.

Whether it is possible to grow all classes of stocks and what is the best method are problems that are receiving attention. Some seed has been planted in the fall and some in the spring; some stored dry and some stratified in various ways. The results even now show clearly that certain kinds of seeds need one treatment and other kinds need another, though in general they should be stored in a cool, moist place for six or eight weeks before they are expected to germinate.

Some lots of seeds have lain dormant, while seedlings from other seed are making good growth. Buried in wet sand or moss and stored in an ice house or refrigerator has given high germination of most fruit seeds.

Willie's Learning

A teacher was giving his class a lecture on charity.

"Willie," he said, "if I saw a boy beating a donkey, and stopped him from doing so, what virtue would I be showing?"

Willie (promptly)—Brotherly love!

American Fruit Grower Magazine for July

FOR SOME TIME many growers located east of the Rockies have experienced a feeling of content in regard to the spray residue problem, which recent market developments appear likely to rudely dissipate.

Competition Will Compel the Use of Fruit Cleaners

Eastern and central western growers, it is true, are not often compelled to meet such late and such persistent attacks of the codling moth larvae as are the growers of the Pacific Coast. The fall rains preceding harvest are usually sufficient to wash the fruit, after a fashion, leaving the fruit sufficiently close to tolerance limit for arsenical residue.

But mechanically washed and cleaned fruit takes on an added attractiveness. It looks cleaner, more inviting, and it is consequently more readily salable. Most growers, after using a fruit cleaner, state they would not be without one even were the regulations amended so as to dispense with the necessity for cleaning.

The eastern and central western growers must ultimately meet this new competitive condition, as they have met others in the past. Sizing machines have made standard grades as to size of the individual fruits. The high color of the western fruit can be equalled and has been equalled by proper trimming to admit light into the trees, and by adequate thinning. No section has any advantage of natural freedom from blemishes from insects or disease.

The added attractiveness of the north-western fruit that comes from enforced washing to remove spray residue can be met only by similar washing to secure the added attractiveness alone.

THERE IS usually a slight let-up in the work on the fruit farm during midsummer, a portion of which can be profitably devoted to making an inventory of the more important needs of the farm and the farm home that can be supplied now or later in the fall. Perhaps a new building is under consideration. Before making final plans for any new construction, it is wise to secure, if possible, plans of similar buildings that have been worked out in the light of general experience and have proved satisfactory. Then, too, there is the advisability of looking into the possibility of getting the material for your proposed building cut to plan and ready to put together. In modern construction, it has proved most economical of material and time to get all building material in the ready-to-put-together state. Concerns who supply building material in this

Plan Now for Farm and Home Conveniences

condition are usually equipped to supply a variety of practical designs for any farm structure. The material is, of course, delivered ready to nail together.

The present dwelling house may need additional conveniences that will make life pleasanter. A large percentage of our readers still use stoves for winter heating—a practice that is neither economical nor very effective. Uniform heat, neither too hot nor too cold, but correct heat throughout the winter, promotes the health of the entire family. And uniform heat plus health is far less costly than stove heat plus doctors and medicine. The type of heating system best adapted to the home can be studied out now. Perhaps the house is so arranged that it can be economically and uniformly heated with a simple, "pipeless" furnace, at but a slight investment. Or it may require steam, hot water or vapor. These points can be studied and decided upon during the summer. The advertising pages of this issue contain much information, and more can be secured by the use of a postal card or two.

Careful planning is apt to mean wise buying, and the careful buyer will secure all the information possible about his intended purchase.

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THE SPREAD between the amount the grower receives for his fruit and what the consumer pays at the store for the same fruit has been the subject of

Additional Profits from Selling to Consumer

much study and discussion among fruit growers. Two articles in this issue shed additional light on this subject and deserve careful consideration by our readers.

One grower, a commercial cherry grower, has secured a larger proportion of the value of his fruit for his own account by building up a mail-order trade. This disposes of his best fruit and at prices that would bring a gasp of amazement from even a down-town fruit stand owner in a metropolitan city. A trade such as this requires time and care to build up, and the most persistent care and attention to maintain and enlarge. But it pays.

The other grower specializes in apples, and by the development of a practical, inexpensive package, has captured the auto trade of his territory. This, too, has paid.

In both cases two points stand out. Quality of product is the basis upon which the trade is built, maintained and expanded. The package in both cases was designed to best serve the class of custom to which the growers catered. Both experiences will be food for serious thought.

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